Vol. 1003 Number 2

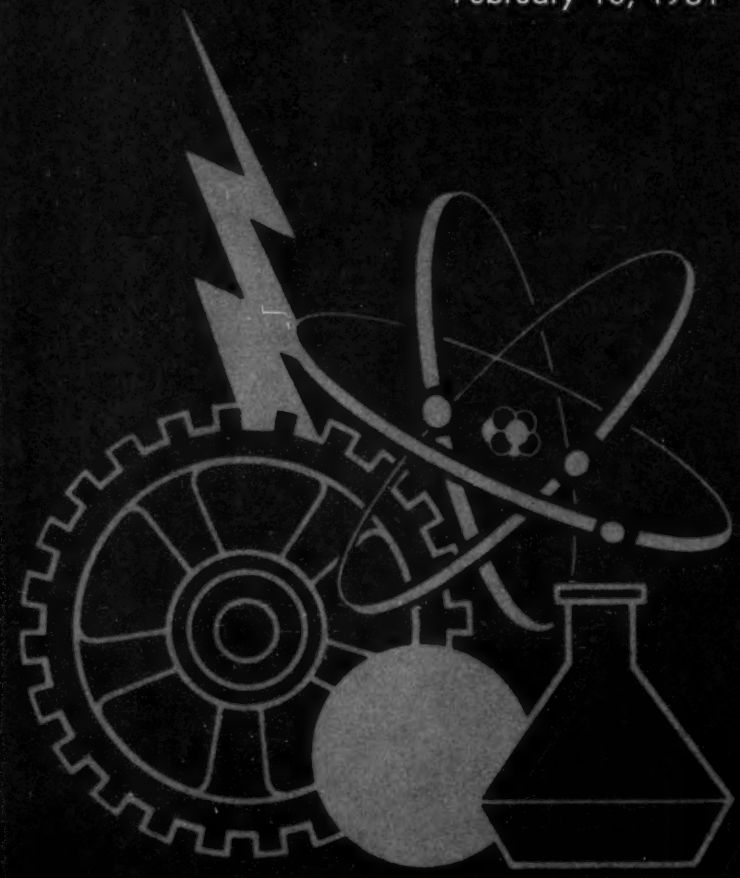
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

February 10, 1981



U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

February 10, 1981 Volume 1003 Number 2

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the list of PCT member countries and the most recent PCT rule changes see the notice appearing at 1001 O.G. 14 in the OFFICIAL GAZETTE of Dec. 9, 1980.

Note that the international fees have been increased as of Jan. 1, 1981. The current schedule of fees is as follows:

Transmittal fee	$ 35.00
Search fee	$300.00
International fees:	
Basic fee (first 30 pages)	$265.00
Basic supplemental fee (for each sheet over 30)	$ 5.00
Designation fee	$ 64.00

SIDNEY A. DIAMOND,
Jan. 13, 1981. *Commissioner of Patents and Trademarks.*

Department of Commerce

PATENT AND TRADEMARK OFFICE
37 CFR Part 1

ADVANCE NOTICE OF PROPOSED RULEMAKING FOR IMPLEMENTING THE REEXAMINATION AND FEE PROVISIONS OF PUBLIC LAW 96–517 (H.R. 6933)

AGENCY: Patent and Trademark Office/Commerce.

ACTION: Advance notice of proposed rulemaking.

SUMMARY: The purpose of this advance notice of proposed rulemaking is to advise the public of the Office's current plans for implementing the reexamination and fee provisions of Public Law 96–517, enacted on December 12, 1980. The reexamination provisions of this new law, including reexamination fees, will take effect on July 1, 1981. New patent and trademark fees, other than reexamination fees, must be established no later than October 1, 1982.

Insofar as the reexamination provisions are concerned, it is expected that proposed rules to implement them will be published in the Federal Register by the middle of January 1981, with publication to follow in the OFFICIAL GAZETTE as soon thereafter as possible. Assuming the proposed rules are published by the middle of January, a public hearing on the proposed rules could be held as early as the first half of April 1981, with the rules being completed and promulgated thereafter.

It will be some time before the Office is ready to publish proposed rules implementing the fee provisions, but the same procedure will be followed as for the reexamination rules. A public hearing will be held following publication of the proposed rules. Completion and promulgation of the rules will follow both an adequate comment period and the public hearing.

ADDRESS: Persons wishing to submit written comments before the proposed rules are published should address them to Michael K. Kirk, Director, Office of Legislation and International Affairs, whose address is: Box 4, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

SUPPLEMENTARY INFORMATION: New fees under the provisions of Public Law 96–517 will not become effective until appropriate rules are promulgated. Until that time, which the Office presently anticipates will be no earlier than July 1, 1981, the present fee provisions will remain in effect. Maintenance fees will be required for any patent actually applied for on or after December 12, 1980, whether or not the patent is entitled to the benefit of an earlier filing date under section 120 of title 35, U.S.C. or a right of priority under section 119 of title 35, U.S.C. The amounts of maintenance fees have not yet been set.

The text of Public Law 96–517 will be published shortly in the OFFICIAL GAZETTE.

This advance notice of proposed rulemaking is issued under the authority of 35 U.S.C. §§ 6 and 41.

Signed: SIDNEY A. DIAMOND,
Dated: Dec. 19, 1980. *Commissioner of Patents and Trademarks.*

Approved: JORDAN J. BARUCH,
Dated: Jan. 8, 1981. *Assistant Secretary for Productivity, Technology and Innovation.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

Re. 29,169, Re. S.N. 203,840, Filed Nov. 4, 1980, Cl. 435/7, PROCESS FOR THE DEMONSTRATION AND DETERMINATION OF REACTION COMPONENTS HAVING SPECIFIC BINDING AFFINITY FOR EACH OTHER, Antonius H. W. M. Schuurs, et al., Owner of Record: *Akzona Incorporated, Asheville, N.C.,* Attorney or Agent: Robert H. Falk, et al., Ex. Gp.: 176

3,707,586, Re. S.N. 046,981, Filed Oct. 1, 1979, Cl. 521/174, HALOGENATED PHOSPHATE POLYESTERS, Richard J. Turley, Owner of Record: *Olin Corporation, New Haven, Conn.,* Attorney or Agent: Thomas P. O'Day, Ex. Gp.: 144

3,802,627, Re. S.N. 201,903, Filed Sep. 19, 1980, Cl. 239/212, IRRIGATION APPARATUS, David Seckler, et al., Owner of Record: *Valmont Industries, Inc., Valley, Nebr.,* Attorney or Agent: Edmund C. Rogers, et al., Ex. Gp.: 313

3,902,668, Re. S.N. 201,904, Filed Sep. 19, 1980, Cl. 239/177, CENTER-PIVOT IRRIGATION SYSTEM, Robert B. Daugherty, et al., Owner of Record: *Valmont Industries, Inc., Valley, Nebr.,* Attorney or Agent: Edmund C. Rogers, et al., Ex. Gp.: 313

3,961,936, Re. S.N. 166,659, Filed Jul. 7, 1980, Cl. 71/93, HERBICIDAL AGENTS, Kurt Westphal, et al., Owner of Record: *Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, West Germany,* Attorney or Agent: Arnold Sprung, Ex. Gp.: 122

3,982,446, Re. S.N. 176,534, Filed Aug. 8, 1980, Cl. 74/488, CRUISE CONTROL APPARATUS FOR HAND GRIP THROTTLE CONTROL, Andrew V. Dyken, Owner of Record: *Inventor,* Attorney or Agent: John A. Waters, Ex. Gp.: 352

4,008,124, Re. S.N. 202,073, Filed Oct. 30, 1980, Cl. 435/31 F, PROCESS FOR THE ISOMERIZATION OF GLUCOSE INTO FRUCTOSE, Yoshimasa Fujita, et al., Owner of Record: *Mitsubishi Chemical Industries, Limited and Seikagaku Kogyo Company, Limited, both of Tokyo, Japan,* Attorney or Agent: Norman F. Oblon, et al., Ex. Gp.: 172

4,008,717, Re. S.N. 070,491, Filed Aug. 28, 1979, Cl. 128/214 R, SYSTEM FOR CONTINUOUS WITHDRAWAL AND ANALYSIS OF BLOOD, Allen A. Kowarski, Owner of Record: *Johns Hopkins University, Baltimore, Md.,* Attorney or Agent: Edwin T. Yates, et al., Ex. Gp.: 335

4,048,320, Re. S.N. 167,751, Filed Jul. 14, 1980, Cl. 424/271, PENICILLINS, John P. Clayton, et al., Owner of Record: *Beecham Group Limited, Brentford, England,* Attorney or Agent: Albert L. Jacobs, et al., Ex. Gp.: 125

4,092,612, Re. S.N. 153,630, Filed May 27, 1980, Cl. 330/288, AMPLIFIER CIRCUITS, Otto H. Schade, Jr., Owner of Record: *RCA Corporation, Princeton, N.J.,* Attorney or Agent: Eugene M. Whitacre, et al., Ex. Gp.: 252

4,094,528, Re. S.N. 158,763, Filed Jun. 12, 1980, Cl. 280/610, SKI STRUCTURE, JOHN M. CLUZEL, Owner of Record: *Inventor,* Attorney or Agent: Donald P. Gillette, Ex. Gp.: 316

4,112,352, Re. S.N. 183,681, Filed Sep. 3, 1980, Cl. 324/30 R, ELECTROCHEMICAL REFERENCE CELL WITH IMPROVED LIQUID JUNCTION, Theodore R. Barben, II, Owner of Record: *Inventor,* Attorney or Agent: Lewis M. Dalgarn, et al., Ex. Gp.: 252

4,121,001, Re. S.N. 197,660, Filed Oct. 16, 1980, Cl. 128/350, CROSSLINKING AGENT FOR POLYMERS AND WIRE CONSTRUCTION UTILIZING CROSSLINKED POLYMERS, Alan J. Gotcher, et al., Owner of Record: *Raychem Corporation, Menlo Park, Calif.,* Attorney or Agent: John D. Young, et al., Ex. Gp.: 164

4,124,774, Re. S.N. 204,557, Filed Nov. 6, 1980, Cl. 179/6.3 R, TELEPHONE STATION COIN MEMORY AND CONTROL SYSTEM, Alfred Zarouni, Owner of Record: *Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.,* Attorney or Agent: S. E. Hollander, et al., Ex. Gp.: 234

4,125,380, Re. S.N. 205,218, Filed Nov. 10, 1980, Cl. 422/180, POLLUTION CONTROL DEVICE, Carmine Negola, Owner of Record: *Inventor,* Attorney or Agent: James F. Bryan, Ex. Gp.: 177

4,125,827, Re. S.N. 203,166, Filed Nov. 3, 1980, Cl. 340/73, AUTOMATICALLY CANCELLING TURN SIGNAL, Robert D. Roudebush, Jr., Owner of Record: *Inventor,* Attorney or Agent: Gerald D. Hosier, et al., Ex. Gp.: 234

4,128,954, Re. S.N. 190,560, Filed Sep. 25, 1980, Cl. 40/310, PACKAGE LABEL AND MANUFACTURE OF SAME, Rollin T. White, Owner of Record: *N.J.M., Inc., Hoboken, N.J.,* Attorney or Agent: John J. Hart, Ex. Gp.: 333

4,138,063, Re. S.N. 187,401, Filed Sep. 15, 1980, Cl. 239/164, HYDRAULICALLY-OPERATED FERTILIZER AND CHEMICAL-SPREADING BOOM, John R. Batts, Owner of Record: *Inventor,* Attorney or Agent: Harold R. Woodard, et al., Ex. Gp.: 313

4,143,276, Re. S.N. 202,492, Filed Oct. 31, 1980, Cl. 250/507, SPENT NUCLEAR FUEL STORAGE RACKS, Leslie Mollon, Owner of Record: *Brooks and Perkins, Incorporated, Southfield, Mich.,* Attorney or Agent: Donald P. Bush, Ex. Gp.: 256

4,145,816, Re. S.N. 205,659, Filed Nov. 10, 1980, Cl. 33/174, SPINDLE PROBE WITH ORBITAL TRANSFORMER, Richard E. Stobbe, et al., Owner of Record: *Kearney and Trecker Corporation, West Allis, Wis.,* Attorney or Agent: Cyril M. Hajewski, Ex. Gp.: 243

4,149,568, Re. S.N. 204,964, Filed Nov. 7, 1980, Cl. 138/114, DOUBLE WALLED FUEL LINE, Donald A. Kuntz, et al., Owner of Record: *Caterpillar Tractor Company, Peoria, Ill.,* Attorney or Agent: William A. Van Santen, et al., Ex. Gp.: 243

4,149,685, Re. S.N. 185,980, Filed Sep. 10, 1980, Cl. 406/51, PNEUMATIC CARRIER WITH ADJUSTABLE CLOSURE MECHANISM, Robert S. Leavelle, Owner of Record: *Inventor,* Attorney or Agent: Gerald Singer, et al., Ex. Gp.: 313

4,169,925, Re. S.N. 202,773, Filed Oct. 31, 1980, Cl. 219/116, TWO-PHASE TRANSFORMER AND WELDING CIRCUIT THEREFOR, Merrill Block, Owner of Record: *Inventor,* Attorney or Agent: John E. McGarry, et al., Ex. Gp.: 213

4,177,329, Re. S.N. 199,160, Filed Oct. 21, 1980, Cl. 429/101, ELECTROLYTE SALTS FOR NON AQUEOUS ELECTROCHEMICAL CELLS, Arabinda N. Dey, et al., Owner of Record: *P. R. Mallory & Co., Inc., Indianapolis, Ind.,* Attorney or Agent: Israel Nissenbaum, et al., Ex. Gp.: 114

4,181,188, Re. S.N. 197,931, Filed Oct. 17, 1980, Cl. 180/2 A, ENERGY EFFICIENT PASSENGER VEHICLE, Richard Dessert, Owner of Record: *Inventor,* Attorney or Agent: Frank D. Gilliam, Ex. Gp.: 316

4,201,065, Re. S.N. 195,703, Filed Oct. 9, 1980, Cl. 62/510, VARIABLE CAPACITY VAPOR COMPRESSION REFRIGERATION SYSTEM, Charles K. Griffin, Owner of Record: *Carrier Corporation, Syracuse, N.Y.,* Attorney or Agent: J. Raymond Curtin, et al., Ex. Gp.: 344

4,218,820, Re. S.N. 199,641, Filed Oct. 22, 1980, Cl. 30/166 R, HAND-ACTUATED CHAIN SAW, William Cleva, Owner of Record: *Inventor,* Attorney or Agent: None, Ex. Gp.: 323

PATENT NOTICES

Certificates of Correction for the Week of Feb. 10, 1981

Re. 30,353	4,209,274	4,220,696	4,228,245
Re. 30,396	4,209,376	4,220,746	4,228,268
Re. 30,399	4,209,393	4,220,755	4,228,485
D. 248,575	4,210,727	4,220,877	4,228,741
D. 248,576	4,210,872	4,221,370	4,229,715
D. 249,434	4,211,201	4,221,744	4,229,774
4,024,796	4,212,716	4,221,933	4,230,035
4,120,733	4,212,762	4,222,050	4,230,520
4,154,593	4,213,690	4,222,062	4,230,593
4,178,153	4,213,882	4,222,274	4,230,657
4,179,213	4,213,953	4,222,519	4,230,686
4,182,758	4,214,419	4,222,668	4,230,797
4,183,084	4,215,375	4,222,952	4,231,013
4,184,999	4,215,684	4,223,147	4,231,968
4,186,244	4,215,929	4,223,682	4,232,250
4,188,468	4,216,223	4,224,662	4,232,578
4,200,807	4,216,773	4,224,723	4,232,587
4,200,881	4,216,830	4,224,919	4,232,887
4,200,926	4,217,393	4,224,945	4,233,094
4,201,590	4,217,835	4,225,001	4,233,268
4,202,337	4,218,140	4,225,049	4,233,333
4,202,826	4,219,275	4,226,111	4,233,369
4,204,375	4,219,398	4,226,277	4,233,381
4,207,393	4,219,473	4,226,367	4,233,466
4,208,354	4,219,479	4,226,531	4,233,544
4,208,612	4,219,700	4,227,089	4,233,693
			4,234,791

Disclaimers

3,573,460.—*George F. Skala,* Scotia, N.Y. ION CHAMBER DETECTOR FOR SUB-MICRON PARTICLES. Patent dated Apr. 6, 1971. Disclaimer filed Nov. 13, 1980, by the assignee, *General Electric Company.*

Hereby enters this disclaimer to claim 1, the sole claim of said patent.

3,663,561.—*Eli W. Blaha,* Highland, Ind. 2-HYDROCARBYLDITHIO - 5 - MERCAPTO-1,3,4-THIADIAZOLES AND THEIR PREPARATION. Patent dated May 16, 1972. Disclaimer filed Oct. 27, 1980, by the assignee, *Standard Oil Company.*

Hereby enters this disclaimer to all claims of said patent.

3,739,691.—*Wilfred S. Bobier,* Bloomfield Hills, Mich. FLUID DEVICE. Patent dated June 19, 1973. Disclaimer filed Nov. 20, 1980, by the inventor.

Hereby enters this disclaimer to claim 7 of said patent.

3,934,214.—*Wendel Edward Archer,* Gahanna, Ohio. SEALED CONTACT HAVING TAPERED REED TIPS. Patent dated Jan. 20, 1976. Disclaimer filed Nov. 26, 1980, by the assignee, *Bell Telephone Laboratories, Incorporated.*

Hereby enters this disclaimer to all claims of said patent.

4,124,864.—*Leon S. Greenberg,* Bridgewater, N.J. PLASTIC ENCAPSULATED SEMICONDUCTOR DEVICES. Patent dated Nov. 7, 1978. Disclaimer filed Nov. 25, 1980, by the assignee, *RCA Corporation.*

Hereby enters this disclaimer to claims 1, 6, 7, and 8 of said patent.

Disclaimer and Dedication

3,811,816.—*Nelson Whitman,* Lincoln, Mass. ACOUSTIC FLAME DETECTORS FOR STEAM GENERATORS. Patent dated May 21, 1974. Disclaimer and dedication filed Dec. 1, 1980, by the assignee, *General Electric Company.*

Hereby disclaims and dedicates to the Public all claims, 1 through 4 of said patent.

Dedication

3,691,707.—*Henry R. Von Arx,* Palo Alto and *Karl J. Zueger,* San Rafael, Calif. SEMICONDUCTOR MATERIAL CUTTING APPARATUS AND METHOD OF MAKING THE SAME. Patent dated Sept. 19, 1972. Dedication filed Nov. 6, 1980, by the assignee, *Sola Basic Industries.*

Hereby dedicates to the Public the remaining term of said patent.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS
Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and, possibly, foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of patent applications cited are available from the National Technical Information Service (NTIS), Springfield, Va. 22161, for $5.00 each ($10.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to avoid premature disclosure. Claims and other technical data will usually be made available to serious prospective licensees upon execution of a non-disclosure agreement.

Requests for information on the licensing of particular inventions should be directed to the addresses cited for the agency-sponsors.

DOUGLAS J. CAMPION,
Program Coordinator,
Office of Government Inventions and Patents,
National Technical Information Service,
U.S. Department of Commerce.

DEPARTMENT OF THE ARMY, OTJAG
Chief, Intellectual Property Division, Room 2D 444
Pentagon, Washington, D.C. 20310

Patent application 6–059,020. Visible and Infrared Intensity Limiter. Filed July 19, 1979.

Patent application 6–060,948. Digital Interface Circuit for Control of Pressure Scanner. Filed July 26, 1979.

Patent application 6–062,099. Highly-Linear Closed-Loop Frequency Sweep Generator. Filed July 30, 1979.

Patent application 6–064,451. Fluid Oscillator. Filed Aug. 7, 1979.

Patent application 6–069,022. Excessive Duty Cycle and Pulse Width Limiter. Filed Aug. 23, 1979.

Patent application 6–074,634. Method and Apparatus for Reduction of Modal Noise in Fiber Optic Systems. Filed Sept. 12, 1979.

Patent application 6–074,636. Fluidic Mud Pulser. Filed Sept. 12, 1979.

Patent application 6–078,996. A Variable Output Coupler for Laser Cavities With Totally Reflecting Mirrors. Filed Sept. 26, 1979.

Patent application 6–080,649. Irradiance Analyzer for High Power Lasers. Filed Oct. 1, 1979.

Patent application 6–084,048. Peierls-Transition For-Infrared Source. Filed Oct. 12, 1979.

Patent application 6–084,686. A Multifrequency Series-Fed Edge Slot Antenna. Filed Oct. 15, 1979.

Patent application 6–089,051. Cerenkov Submillimeter Electromagnetic Wave Oscillator. Filed Oct. 29, 1979.

Patent application 6–092,180. Rivets for Structures Subject to Vibrations or Thermal Stresses. Filed Nov. 7, 1979.

Patent application 6–093,083. Single-Fiber Connected Microphone-Type Acoustic-to-Electrical Transducer. Filed Nov. 9, 1979.

Patent application 6–093,084. Fluidic Mud Pulse Telemetry Transmitter. Filed Nov. 9, 1979.

Patent application 6–099,367. Microprocessor Base for Monitor/Control of Communications Facilities. Filed Dec. 3, 1979.

Patent application 6–103,753. Optical Recording Memory Medium. Filed Dec. 14, 1979.

Patent application 6–103,798. Microstrip Antenna With Polarization Diversity. Filed Dec. 14, 1979.

Patent application 6–116,422. Plating Area Calculator for Printed Circuit Boards. Filed Jan. 29, 1980.

Patent application 6–120,215. Apparatus Using Light Emitting Diode as Information Transmitter and Receiver. Filed Feb. 11, 1980.

Patent application 6–121,181. Parasitic Capacitance Compensation in CMOS-Switched Active Fliter. Filed Feb. 13, 1980.

Patent application 6–122,208. Method and Apparatus for Electrically Testing Radiation Susceptibility of MOS Gate Devices. Filed Feb. 19, 1980.

Patent application 6–132,358. Cabinet for Patch Panels Used With Analog Computers. Filed Mar. 20, 1980.

Patent 4,181,968. Method and Apparatus for Forming Convolutions of Two Complex Number Sequences Using the Fermat Number Transform. Filed June 14, 1978. Patented Jan. 1, 1980. Not available NTIS.

Patent 4,193,044. Rare Earth Semiconductor Laser. Filed Jan. 26, 1978. Patented Mar. 11, 1980. Not available NTIS.

U.S. DEPARTMENT OF THE AIR FORCE

AF/JACP, 1900 Half St., SW., Washington, D.C. 20324

Patent 4,212,441. Wing Pivot Assembly for Variable Sweep Wing Aircraft. Filed May 11, 1978. Patented July 15, 1980. Not available NTIS.

Patent 4,213,004. Hermetic Electrical Feedthrough for Aluminum Housing and Method of Making Same. Filed June 30, 1978. Patented July 15, 1980. Not available NTIS.

Patent 4,213,045. Metal Nitride Oxide Semiconductor (MNOS) Dosimeter. Filed Aug. 29, 1978. Patented July 15, 1980. Not available NTIS.

Patent 4,213,102. Fluorine Generator for Chemical Lasers. Filed Mar. 21, 1978. Patented July 15, 1980. Not available NTIS.

Patent 4,213,122. Intrusion Detection System. Filed Aug. 23, 1978. Patented July 15, 1980. Not available NTIS.

Patent 4,213,123. Integral Enable-Disable Means for Guided Wave Radar Intrusion Detector System Portals. Filed Feb. 7, 1979. Patented July 15, 1980. Not available NTIS.

Patent 4,213,127. Doubly Adaptive CFAR Apparatus. Filed Jan. 31, 1979. Patented July 15, 1980. Not available NTIS.

Patent 4,213,168. Electret Charge Technique. Filed July 20, 1978. Patented July 15, 1980. Not available NTIS.

Patent 4,214,904. Gold-Tin-Silicon Alloy for Brazing Silicon to Metal. Filed Dec. 12, 1978. Patented July 29, 1980. Not available NTIS.

Patent 4,215,072. Diphospha-S-Triazines. Filed Feb. 7, 1979. Patented July 29, 1980. Not available NTIS.

Patent 4,215,181. Fretting Fatique Inhibiting Method for Titanium. Filed May 11, 1978. Patented July 22, 1980. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE

Program Agreements and Patent Branch, Administration Service Division, Federal Bldg., Science and Education Administration, Hyattsville, Md. 20782

Patent application 6–052,656. Improved Tree Rooting Using Synthetic Auxins. Filed June 27, 1979.

Patent application 6–130,634. Machine for Planting Containerized Tree and Shrub Seedlings. Filed Mar. 14, 1980.

Patent application 6–132,591. Steep Slope Seeding Machine Filed Mar. 21, 1980.

Patent application 6–176,234. Dietary Supplementation With Essential Metal Picolinates. Filed Aug. 8, 1980.

Patent application 6–176,235. Method of Enhancing Activity of Homogeneous Ziegler-Type Copper Catalysts. Filed Aug. 8, 1980.

Patent 4,225,629. Preparation of Protein Concentrates From Whey and Seed Products. Filed Aug. 15, 1977. Patented Sept. 30, 1980. Not available NTIS.

U.S. DEPARTMENT OF COMMERCE

National Technical Information Service
Office of Government Inventions and Patents
Springfield, Va. 22161

Pateent application 6–192,129. Cryptographic Key Notarization Methods and Apparatus. Filed Sept. 29, 1980.

U.S. DEPARTMENT OF ENERGY

Assistant General Counsel for Patents
Washington, D.C. 20545

Patent 4,196,359. Differentially-Charged and Sequentially-Switched Square-Wave Pulse Forming Network. Filed June 8, 1978. Patented Apr. 1, 1980. Not available NTIS.

Patent 4,196,417. Single Transmission Line Interrogateo Multiple Channel Data Acquisition System. Filed Nov. 28, 1977. Patented Apr. 1, 1980. Not available NTIS.

Patent 4,197,461. Miniaturized Radiation Chirper. Filed Aug. 17, 1978. Patented Apr. 8, 1980. Not available NTIS.

Patent 4,197,462. Position-Sensitive Proportional Counter With Low-Resistance Metal-Wire Anode. Filed Dec. 4, 1978. Patented Apr. 8, 1980. Not available NTIS.

Patent 4,200,821. Relativistic Electron Beam Crossed-Field Device. Filed Mar. 17, 1977. Patented Apr. 29, 1980. Not available NTIS.

Patent 4,201,692. Gas Mixtures for Gas-Filled Particle Detectors. Filed Jan. 22, 1979. Patented May 6, 1980. Not available NTIS.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

National Institutes of Health, Chief, Patent Branch
Westwood Bldg., Bethesda, Md. 20205

Patent 4,222,126. Unitized Three Leaflet Heart Valve. Filed Dec. 14, 1978. Patented Sept. 16, 1980. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY

Director, Navy Patent Program/Patent Counsel for the Navy, Office of Naval Research, Code 302
Arlington, Va. 22217

Patent application 6–118,043. Electrical Connection. Filed Feb. 4, 1980.

Patent application 6–118,132. Protective Coating. Filed Feb. 4, 1980.

Patent application 6–126,588. Apparatus and Method for Multiplexing Digital Signals. Filed Mar. 3, 1980.

Patent application 6–142,322. Towed Deployment Acoustic Arrays. Filed Apr. 21, 1980.

Patent application 6–154,348. Method of Separating Light Isotopes Like 15N From Naturally Abundant Gases, Such as NO. Filed May 29, 1980.

Patent application 6–160,350. Liquid Propellant. Filed June 17, 1980.

Patent application 6–161,615. Portable On-Site Turning Apparatus. Filed June 20, 1980.

Patent application 6–165,598. Programmable Frequency Synthesizer (PFS). Filed July 3, 1980.

Patent application 6–166,413. Maximum Depth Monitoring Apparatus. Filed June 7, 1980.

Patent application 6–167,275. A Sawtooth Waveform Generating Circuit for Utilization in a Helmet Mounted Display. Filed July 19, 1980.

Patent application 6–167,276. Computer Generated Image Simulator. Filed July 10, 1980.

Patent application 6–167,851. Packaging for Ocean Disposal of Low Level Radioactive Waste Material. Filed July 14, 1980.

Patent application 6–168,974. Flexible Side Connector for Floating and Elevated Platforms. Filed July 14, 1980.

Patent application 6–170,492. Array Convolver/Correlator. Filed July 21, 1980.

Patent application 6–181,524. Cable Connector. Filed Aug. 26, 1980.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

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Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
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Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
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New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
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New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Public Library of Cincinnati & Hamilton County	(513) 369-6936
	Cleveland Public Library	(216) 623-2932
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	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
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	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

**Call only between the hours of 12 o'clock noon and 5 :00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF NOVEMBER 29, 1980

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy: Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	11-23-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-10-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthodontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	9-11-79
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director. Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	12-12-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	12-5-79
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—Vacant. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	1-8-79
SPECIAL LAWS ADMINISTRATION, GROUP 220—Vacant. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	7-2-79
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—Vacant. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	10-9-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	1-22-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-21-78
DESIGNS, GROUP 290—Vacant. Industrial Arts; Household, Personal and Fine Arts.	1-8-79
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	8-18-79
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	7-20-79
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	8-1-79
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	6-1-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director. Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Misc. Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	3-19-79

Expiration of patents: The patents within the range of numbers indicated below expire during November 1980, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,109,176 to 3,112,486, inclusive
Plant Patents ..... Numbers 2,295 to 2,323, inclusive

REISSUES

FEBRUARY 10, 1981

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

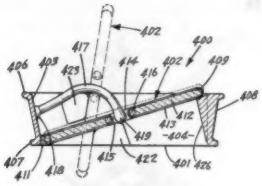
Re. 30,507
HEART VALVE PROSTHESIS

Robert L. Kaster, 2730 Vagabond La., Wayzata, Minn. 55391

Original No. 3,959,827, dated Jun. 1, 1976, Ser. No. 493,022, Jul. 30, 1974. Continuation-in-part of Ser. No. 282,706, Aug. 8, 1972, Pat. No. 3,825,957. Application for reissue Mar. 22, 1979, Ser. No. 22,786

Int. Cl.³ A61F *1/22*

U.S. Cl. 3—1.5 **27 Claims**



17. A heart valve prosthesis for controlling the flow of blood in a heart comprising: a base having a passage for carrying blood through the base and means for accommodating a suturing member used to secure the heart valve to heart tissue, valving means [movable] *comprising a disc valve member mounted in assembled relation with the base for movement* relative to the base [to] *between* an open position to allow blood to flow through the passage in one direction and to a closed position to restrict the flow of blood in the opposite direction through the passage, means for holding the valving means in movable assembled relation with the base, and means associated with the valving means and *with the* means for holding the valving means for progressively moving the [valving means] *disc valve members* from the open position to the closed position in response to a reduction of the pressure of the blood moving through said passage.

Re. 30,508
APPARATUS FOR STRAIGHTENING CELL-FORMING PARTITIONS IN A CARTON

John L. Raudat, North Madison, Conn., and Adam Z. Rydell, Decatur, Ga., assignors to Standard-Knapp, Inc., Portland, Conn.

Original No. 4,034,656, dated Jul. 12, 1977, Ser. No. 697,798, Jun. 18, 1976. Application for reissue Jul. 11, 1979, Ser. No. 56,642

Int. Cl.³ B31D *3/04*

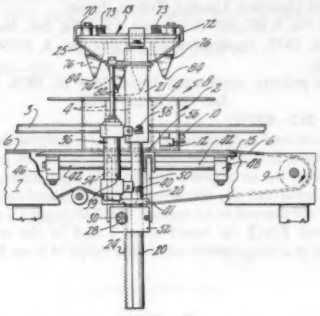
U.S. Cl. 493—409 **10 Claims**

8. Apparatus for straightening cell-forming partitions in a carton, comprising:

means for conveying cartons to and away from a partition straightening station;

means for stopping each carton at said partition straightening station, including means for supporting each carton therein;

mandrel means movable toward and away from said carton supporting means in said partition straightening station, said mandrel means including inner and outer partition cell engageable elements having tapered lower ends projecting toward said carton supporting means for sequentially engaging first the inner partitions and only then the outer cell defining partitions of the carton as said mandrel means moves toward said carton supporting means.



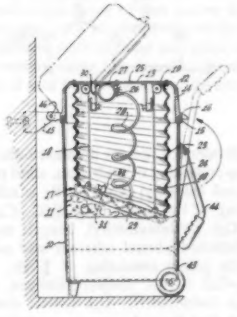
Re. 30,509
REFUSE COMPACTOR

Robert A. Peterson, 16521 Redwood Dr., Cerritos, Calif. 90701

Original No. 3,835,769, dated Sep. 17, 1974, Ser. No. 387,436, Aug. 10, 1973. Continuation-in-part of Ser. No. 254,067, May 17, 1972, abandoned. Application for reissue Oct. 23, 1978, Ser. No. 953,500

Int. Cl.² B30B *1/32, 15/16*

U.S. Cl. 100—227 **23 Claims**



1. A refuse compactor comprising:

a rigid container having a cover for closing a refuse receiving opening of said container;

an air seal means for sealing the junction of said cover with said opening when said cover is closed;

a flexible air-tight means peripherally affixed to said cover and dividing said container into two separate chambers one of which is defined, at least in part, by said cover;

means to communicate said one of said two chambers to atmospheric pressure;

and means to evacuate air from the other of said two chambers to effect movement of said flexible means by atmospheric pressure in a direction to reduce the volume of said other chamber to compact refuse within said other chamber while biasing said cover against said air seal

means to prevent leakage of atmospheric pressure into said other chamber.

Re. 30,510

PROCESS FOR PREPARING CATALYST FOR OLEFIN POLYMERIZATION

Ryozo Taniyasu, Yokohama; Hideo Kurokawa, Kawasaki, and Takeshi Saito, Chiba, all of Japan, assignors to The Lion Fat and Oil Company Limited, Tokyo, Japan

Original No. 4,107,080, dated Aug. 15, 1978, Ser. No. 793,545, May 4, 1977. Application for reissue Jul. 3, 1979, Ser. No. 54,619

Claims priority, application Japan, May 10, 1976, 51-52161

Int. Cl.³ B01J *31/02*

U.S. Cl. 252—431 C **7 Claims**

1. A process for preparing a catalyst for polymerization of a mono olefin having 6 through 20 carbon atoms comprising condensing: (a) an aliphatic carboxylic acid having 3 to 12 carbon atoms and, (b) aluminum chloride, aluminum bromide or a mixture thereof, in an amount of 0.7 through 1.2 mol of the component [(b)] *(a)* based upon 1 mol of the component [(a)] *(b)* at a temperature within the range of from 30° to 150° C.

Re. 30,511

IMIDAZO[1,5-D]-AS-TRIAZINE-4(3H)-ONES AND THIONES

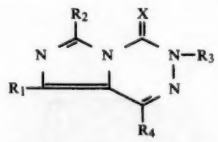
Rolf Paul, River Vale, N.J., and Judith Menschik, Tappan, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Original No. 4,107,307, dated Aug. 15, 1978, Ser. No. 843,174, Oct. 18, 1977. Continuation-in-part of Ser. No. 765,318, Feb. 3, 1977, abandoned. Application for reissue Aug. 8, 1979, Ser. No. 64,672

Int. Cl.³ C07D *487/04*; A61K *31/53*

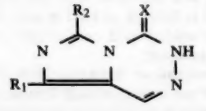
U.S. Cl. 424—249 **51 Claims**

1. A compound of the formula:



wherein X is divalent oxygen or divalent sulfur; R_1 is selected from the group consisting of hydrogen, alkyl (C_1–C_3), chloro, bromo, iodo and haloalkyl (C_1–C_3); R_2 is selected from the group consisting of hydrogen, alkyl [(C_1–C_4)] *(C_1–C_4)*, cycloalkyl (C_3–C_6), methoxymethyl, benzyl, naphthyl, phenyl and mono-substituted phenyl wherein said substituent is selected from the group consisting of [halo, alkyl (C_1–C_4), haloalkyl (C_1–C_3) amino, dialkyl-] *halogen, alkyl (C_1–C_4), alkoxy (C_1–C_4), haloalkyl (C_1–C_3), amino, dialkyl*-amino and nitro; R_3 is selected from the group consisting of hydrogen, alkyl (C_1–C_3), alkenyl (C_3–C_4) and alkynyl (C_3–C_4); R_4 is selected from the group consisting of hydrogen and alkyl (C_1–C_3).

22. A method of inhibiting the enzyme phosphodiesterase in a mammal which comprises administering internally to said mammal an effective amount of a compound of the formula:



wherein X is divalent oxygen or divalent sulfur; R_1 is selected from the group consisting of hydrogen, chloro, bromo and alkyl having up to 3 carbon atoms; and R_2 is selected from the group consisting of hydrogen, alkyl having up to 4 carbon atoms, phenyl, benzyl, methoxymethyl and o-propoxyphenyl.

Re. 30,512

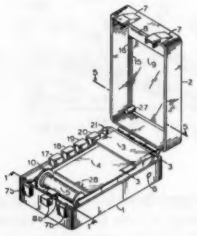
STRIP CHART RECORDER

John C. Stires, III, Box 988, Rancho Santa Fe, Calif. 92067

Original No. 4,074,275, dated Feb. 14, 1978, Ser. No. 765,600, Feb. 4, 1977. Application for reissue Mar. 20, 1978, Ser. No. 890,857

Int. Cl.³ G01D *9/12*

U.S. Cl. 346—19 **5 Claims**



4. A strip chart recorder comprising in combination:

a case having an open top,

a cover having an opening therein hinged to the case for covering said open top,

a door mounted in the opening in said cover and for providing access to the interior of said case when said cover is closed and said door having a self locking mechanism,

a container mounted in said case for holding a strip chart,

drive means including an electric motor for advancing said chart, a battery circuit powering said motor, an electronic circuit including an electronic clock and programming means for controlling the battery circuit for driving the electric motor at selected programmable speeds,

a transducer for sensing an environmental variable, said transducer having a stylus for writing on a pressure sensitive strip chart,

means responsive to closing said door for closing the battery circuit only when the cover of the case is closed, and said case having a surface over which the strip chart moves.

Re. 30,513

COLOR SPLITTING PRISM ASSEMBLY

Adrianus A. J. Bleukens, deceased, late of Eindhoven, Netherlands; by Friedrich J. De Haan, administrator, Valkenswaard, Netherlands; Jacobus Stoffels, and Petrus J. M. Peters, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Original No. 4,084,180, dated Apr. 11, 1978, Ser. No. 730,164, Oct. 7, 1976. Application for reissue Sep. 24, 1979, Ser. No. 78,617

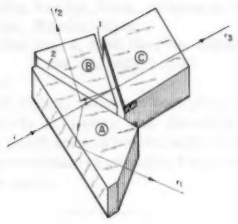
Claims priority, application Netherlands, Oct. 9, 1975, 7511838

Int. Cl.³ H04N *9/09*; G02B *27/14*

U.S. Cl. 358—55 **3 Claims**

1. A beam splitting prism assembly comprising a plurality of prisms *having surfaces* separated by an air gap, the edges of the

prism surfaces bounding the air-gap being provided with a small strip at the [glass] *prism* surfaces, said strip comprising



an adhering film of a thermoplastic material [located thereon forming a beam splitting layer].

Re. 30,514

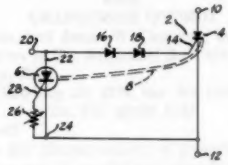
THERMALLY SELF-PROTECTED POWER SWITCHING SEMICONDUCTOR DEVICE

Roy Hyink, Wauwatosa; Stanley V. Jaskolski, Sussex, both of Wis.; Robert W. Lade, Charlotte Amalie, St. Thomas Virgin Isls. of U.S.; Herman P. Schutten, Elm Grove, and Gordon B. Spellman, Mequon, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Original No. 4,087,848, dated May 2, 1978, Ser. No. 725,105, Sep. 20, 1976. Application for reissue Mar. 19, 1979, Ser. No. 21,789

Int. Cl.[3] **H02H** *5/04*

U.S. Cl. 361—103 **21 Claims**



1. A thermally self-protected power switching semiconductor device comprising:

a power switching thyristor having a pair of main terminals for carrying load current and a gate for controlling the conduction state thereof;

a gate terminal electrically connected to said gate for carrying signal current thereto;

a temperature sensitive thyristor thermally coupled to said power switching thyristor and electrically connected *directly* to said gate terminal in parallel with said gate *such that there is no significant resistance between said temperature sensitive thyristor and said gate terminal*, said temperature sensitive thyristor being thermally actuatable to intrinsically switch between high and low resistance states such that said temperature sensitive thyristor senses a predetermined temperature of said power switching thyristor and automatically responds thereto by switching to said low resistance state to shunt said gate, said predetermined temperature being less than the thermal breakover temperature of said power switching thyristor.

PLANT PATENTS

GRANTED FEBRUARY 10, 1981

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,642
ROSE PLANT

Harmon F. Saville, Rowley, Mass., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Jan. 4, 1980, Ser. No. 109,689
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of rose plant of the miniature class, substantially as shown and described, characterized particularly by peach colored blooms borne primarily singly to a stem on a vigorous plant of attractive foliage which lighten to pale pink upon aging.

4,643
PLUM TREE

James T. Mulligan, 11572 E. Nebraska, Selma, Calif. 93662

Filed Sep. 4, 1979, Ser. No. 72,196
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—38 **1 Claim**

1. A new and distinct variety of plum tree, substantially as illustrated and described, characterized particularly as to novelty by its heavy bloom and its heavy and regular bearing of fruit which has a very dark, almost black, purplish-red colored skin and which is uniformly of substantially globose form and generally characterized by its bearing of medium sized, amber-fleshed, fruit which ripens in early midseason.

4,644
PEACH TREE

Darryl P. Magnuson, Kingsburg, Calif., assignor to Richland Sales Co., Reedley, Calif.

Filed Oct. 9, 1979, Ser. No. 83,120
Int. Cl.[3] A01H *5/03*
U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree, substantially as illustrated and described, which is generally similar, in tree and fruit, to the O'Henry variety, but distinctively characterized by a ripening period approximately ten days later.

4,645
GRAPEFRUIT HYBRID

Robert K. Soost, and James W. Cameron, both of Riverside, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Aug. 20, 1979, Ser. No. 68,050
Int. Cl.[3] A01H *5/03*
U.S. Cl. Plt.—45 **1 Claim**

1. The new and distinct variety of grapefruit hybrid plant herein described and illustrated and identified by the characteristics enumerated above.

4,646
LILY PLANT NAMED SUPERSTAR

Ted T. Kirsch, Myrtle Point, Oreg., assignor to Sun Valley Bulb Farms, Inc., Myrtle Point, Oreg.

Filed Sep. 27, 1979, Ser. No. 79,331
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of Oriental hybrid lily plant, substantially as herein shown and described, characterized by its very large, upwardly facing flowers borne on strong, stiff pedicels, and by the substantially overall bright purplish red coloring of the sepals and petals which are bordered by a white sinuous margin.

4,647
CHRYSANTHEMUM PLANT

Gordon N. Weber, Milwaukie, Oreg., assignor to Weber's Riverside Greenhouses, Milwaukie, Oreg.

Filed Aug. 14, 1979, Ser. No. 66,427
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—78 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium*, Ramat., known by the cultivar name Bolero and particularly characterized as to uniqueness by the combined characteristics of spider capitulum type; flat capitulum form; medium bronze ray floret color; diameter across face of capitulum from 125 to 150 mm. at maturity; uniform ten week flowering response to photoperiodic short-day control; medium plant height and spreading branching pattern.

PATENTS

GRANTED FEB. 10, 1981

ERRATA

For CLASS	See PATENT NO.
434–103	4,249,318
404–114	4,249,327
474–110	4,249,425
209–031	4,249,655
228–015.1	4,249,692
369–219	4,249,745
369–221	4,249,746
369–136	4,249,747
273–193 A	4,249,762
423–121	4,250,032
564–104	4,250,109
564–156	4,250,110
564–129	4,250,111
564–291	4,250,112
564–153	4,250,113
564–315	4,250,114
564–436	4,250,115
564–467	4,250,116
568–377	4,250,117
568–338	4,250,118
568–389	4,250,119
568–445	4,250,120
568–431	4,250,121
570–209	4,250,122
570–185	4,250,123
428–234	4,250,172
290–001 R	4,250,395
219–218	4,250,396
219–345	4,250,397
219–345	4,250,398
219–532	4,250,399
219–549	4,250,400
235–092 DE	4,250,401
235–092 DN	4,250,402
235–092 DN	4,250,403
235–092 FP	4,250,404
235–456	4,250,405
368–082	4,250,523

PATENTS

GRANTED FEBRUARY 10, 1981

GENERAL AND MECHANICAL

4,249,267

MAGNETIC FABRIC FASTENER AND CLOSURE MEANS

Clifford C. Voss, 406 Donald Ave., Clawson, Mich. 48017

Filed Sep. 4, 1979, Ser. No. 72,020

Int. Cl.[3] A41D *1/06;* A41B *1/10;* A41F *9/02*

U.S. Cl. 2—69 **5 Claims**

1. Fastener means for fabric and like materials, and comprising:

a relatively thin, pliable, light-weight polymer material, roll formed and provided in selected lengths and widths, being normally flat and plane surfaced, and of a composition capable of being permanently magnetized and having magnetic properties for relative attraction and holding engagement with other like and comparable materials similarly formed and provided,

said material being of itself so formed, flexible and pliable as to allow overlapping engagement and attraction to next adjacent similar material and for selective progressive separation of said materials from each other beginning at a given end thereof,

and means for providing said materials on fabrics and cloths along cooperating edges thereof to form and provide an operable closure therebetween.

4,249,268

GARMENT COMPOSED OF NON-STRETCHABLE BODY PORTION ENTIRELY COVERED BY LOOP FASTENERS AND STRETCHABLE PORTIONS NOT SO COVERED

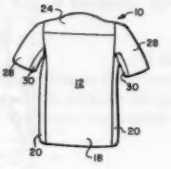
Herbert Berler, 38-15 Bowne St., Flushing, N.Y. 11354

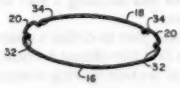
Filed May 30, 1979, Ser. No. 43,858

Int. Cl.[3] A41B *1/00*

U.S. Cl. 2—115 **3 Claims**

1. A kit comprising a close-fitting garment including a body portion and sleeve portions, said body portion having a neck opening smaller than a wearer's head but adapted for insertion of a wearer's head when the garment is donned, said garment being essentially composed of a non-stretchable main fabric having a plurality of small loop elements on the entire outer surface thereof, with the corresponding inner surface of the main fabric being coated with resin to ensure uniformity and integrity of the main fabric, the resin coating rendering the main fabric non-stretchable, and at least one ornament having a plurality of small hook elements on a rear surface thereof adapted to engage said loop elements of said main fabric so that the ornament is separably attachable to said garment, said body portion having an upper part surrounding the neck opening, said upper part being formed of a stretchable knitted fabric to permit the wearer's head to pass through the neck opening though the neck opening is smaller than the wearer's head, said body portion further including at least one knitted body strip extending in the longitudinal direction of the body portion and





each sleeve portion including a knitted sleeve strip extending in the longitudinal direction of the sleeve portion, said body strip and sleeve strips being formed of a stretchable fabric, whereby, despite the non-stretchable character of the main fabric and the close-fitting cut of the garment, the garment is easily donned and no active movement is prohibited thereby.

4,249,269

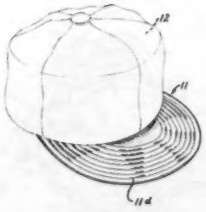
CAP VISOR

James E. Price, New Albany, Ind., assignor to Adver-Togs, Inc., New Albany, Ind.

Filed Dec. 5, 1977, Ser. No. 823,208

Int. Cl.[3] A42B *1/02, 1/04*

U.S. Cl. 2—195 **2 Claims**



1. A visor for a cap comprising an upper vinyl plastic outer member, and insert board and a lower vinyl plastic outer member, where said upper vinyl plastic outer member and said lower vinyl plastic outer member are heat sealed together along the outer edges thereof to fully encapsulate said insert

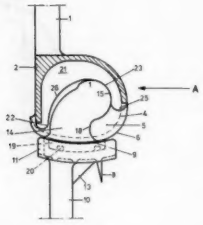
board in a water sealed relationship, and where said upper vinyl plastic outer member includes a pattern of molded simulated stitch lines on the top surface thereof.

4,249,270

ENDOPROSTHESIS FOR A KNEE JOINT

Andre Bahler; Norbert Gschwend, and Heinrich Scheier, all of Zurich, Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Oct. 1, 1979, Ser. No. 80,671
Int. Cl.[3] A61F *1/24*
U.S. Cl. 3—1.911 **7 Claims**



5. An endoprosthesis for a knee joint comprising

a femur part having a fork-like end defining a pair of condyle-shaped bearing surfaces;

means disposed within said femur part to define a contoured boundary surface defining a first curvilinear section and a following second cylindrical section having a center of curvature; and

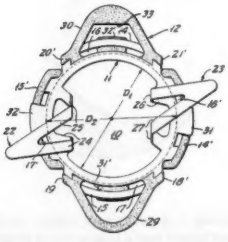
a tibia part having a pair of rolling surfaces each disposed in opposition to a respective condyle-shaped bearing surface and a web of material different from said means between said rolling surfaces, said web being curved in a direction away from said first curvilinear section towards said cylindrical section and having a head thereon with a peripheral surface of cylindrical shape, said peripheral surface having a center of curvature whereby, in a stretched position of said femur part and said tibia part, said bearing and rolling surfaces are loaded and said centers of curvature coincide with an axis of rotation of the knee joint and, during bending of said parts from said stretched position, said bearing and rolling surfaces and said cylindrical section and said head slide over one another.

4,249,271

INTRAOCULAR LENS

Stanley Poler, 78 E. Second St., New York, N.Y. 10003

Continuation-in-part of Ser. No. 9,926, Feb. 6, 1979, abandoned. This application Jul. 13, 1979, Ser. No. 57,323
Int. Cl.[3] A61F *1/16, 1/24*
U.S. Cl. 3—13 **39 Claims**



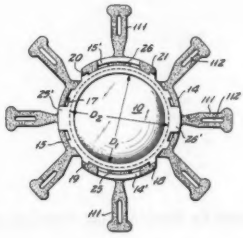
31. As an article of manufacture, a mounting-adapter element of compliant sheet material for iris-stabilized mounting of an intraocular lens element of circular peripheral contour, comprising a body member having a circumferentially continuous centrally open inner-rim formation of inner diameter less than the outer diameter of the lens element and for axial-retaining abutment with one axial side of the rim of the lens element, means carried at a radially outer region of said body member for axial-retaining abutment with the other axial side of the rim of the lens element, and a plurality of angularly spaced lens-positioning feet formed integrally with the inner edge of said body member, said feet extending radially outwardly of the rim diameter of the lens element and at axial offset from said body member in the direction away from said means.

4,249,272

INTRAOCULAR LENS

Stanley Poler, 78 E. Second St., New York, N.Y. 10003

Continuation-in-part of Ser. No. 57,323, Jul. 13, 1979, which is a continuation-in-part of Ser. No. 9,926, Feb. 6, 1979, abandoned. This application Mar. 5, 1980, Ser. No. 127,450
Int. Cl.[3] A61F *1/16, 1/24*
U.S. Cl. 3—13 **9 Claims**



1. As an article of manufacture, an optically finished intraocular lens element having a generally circular periphery about its optical axis, and a mounting adapter for said lens element, said adapter comprising two circumferentially continuous annular body members having a circular inner edge of diameter less than the diameter of said lens element, said body members being adjacent opposite axial sides of the peripheral region of said lens element and being connected to each other within a geometrical annulus radially outside said lens element, and a plurality of angularly spaced lens-positioning feet extending radially outwardly of the periphery of said geometrical annulus and having radially compliant integral connection to one of said body members, said one body member being of compliant flat sheet material and in which all of said feet extend substantially directly radially outwardly to an extent substantially exceeding the maximum inside diameter of the inner wall of a crystalline-lens sac following invasive surgery to remove cataracted material from the sac, each of said feet being sufficiently compliant in its mode of bending from the flat sheet to lightly compliantly adapt to local sac-wall contour at contact therewith.

4,249,273

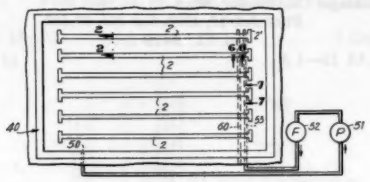
TILE CONSTRUCTION FOR A SWIMMING POOL

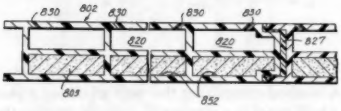
Henry Jakowicki, 123 Malts AVe., West Islip, N.Y. 11795

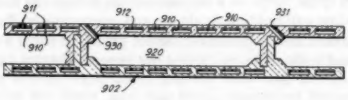
Continuation-in-part of Ser. No. 839,039, Oct. 3, 1977, which is a continuation-in-part of Ser. No. 734,328, Oct. 20, 1976, Pat. No. 4,051,562. This application Dec. 9, 1977, Ser. No. 859,253
Int. Cl.[2] E04H *3/16, 3/18*
U.S. Cl. 4—494 **11 Claims**

1. Tile construction for a swimming pool comprising an elongated member having a main longitudinal channel therein, said member being provided with a plurality of orifices extending into said channel and opening externally of the member to provide communication between the channel and the exterior of the member to provide a flow path for a fluid, said member

having an outer surface adapted for constituting part of the surface of the pool, said orifices being open in the vicinity of said outer surface, said member having a flange bounding said







main channel with a plurality of further channels therein, said further channels extending longitudinally parallel to said main channel and being wholly confined within said flange for fluid flow independently of the fluid in said main channel.

4,249,274

APPARATUS FOR SANITIZING TOILETS

David J. Kitko, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 972,318, Dec. 22, 1978, Pat. No. 4,200,606. This application Dec. 3, 1979, Ser. No. 99,356

Int. Cl.³ E03D *9/02, 9/03;* **A61L** *1/00*

U.S. Cl. 4—227 **3 Claims**

1. An article of manufacture designed for placement in the flush tank of a toilet, said article comprising two dispensing means, the first dispensing means containing a solid composition which is soluble in water and comprises a compound which provides hypochlorite ions in aqueous solution, and a second dispensing means containing a solid composition which is soluble in water and which contains a dye selected from the group consisting of FD&C Blue No. 1 and FD&C Green No. 3, said first dispensing means and second dispensing means each having means for receiving water from the flush tank when said flush tank refills after a flush and for maintaining said received water in contact with the respective solid compositions in said first and second dispensing means during the quiescent period between flushes so as to form concentrated solution of said compositions in said respective dispensing means between flushes, said first dispensing means and second dispensing means having means for retaining said concentrated solutions in substantial isolation from each other and from the body of water in the flush tank during the quiescent period between flushes, said first dispensing means and said second dispensing means each having means for releasing said concentrated solutions into the water in the flush tank when said water flows from the tank during flushing, said first and second dispensing means cooperating to produce a concentration of available chlorine of from about 2 ppm to about 10 ppm, a concentration of dye of from about 0.5 ppm to about 5 ppm and a ratio of available chlorine to dye of from about 2:1 to 6:1 in the bowl water after the flush.

4,249,275

PROCESS FOR DYEING AND PRINTING CELLULOSE FIBRES

Herbert Hugl, Leverkusen; Gerhard Wolfrum, Leverkusen; Henning Reel, Cologne; Werner Künnel, Leverkusen; Robert Kuth, Cologne, and Wilhelm Gohrbandt, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

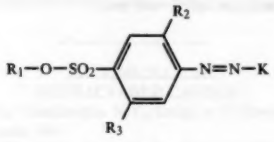
Filed Apr. 14, 1980, Ser. No. 140,349

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1979, 2916861

Int. Cl.³ D06P *3/82*

U.S. Cl. 8—532 **9 Claims**

1. Process for dyeing and printing cellulose fibres swollen with water-miscible swelling agents or fibre blends containing these fibres, characterised in that the fibres are treated with dyestuffs of the general formula



wherein

R_1 represents aryl,

R_2 represents halogen, CN, CF_3, NO_2, Q_1, $-OQ_1$, $-COOQ_1$, $-CONQ_1Q_2$ or $-NHCOQ_1$,

R_3 represents H, halogen, CN, CF_3, Q_1 or $-OQ_1$ and

K represents the radical of a coupling component,

wherein

Q_1 denotes alkyl or aryl and

Q_2 denotes hydrogen, alkyl or aralkyl,

and the dyestuffs are fixed by heat treatment.

4,249,276

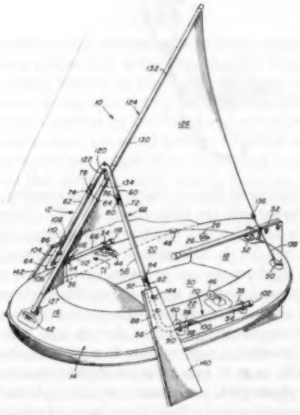
INFLATABLE SAILBOAT

Fredric Snyderman, 6 Franklin Rd., Sharon, Mass. 02067

Filed Jun. 7, 1979, Ser. No. 46,219

Int. Cl.³ B63B *7/00*

U.S. Cl. 9—2 A **10 Claims**



1. An inflatable sailboat comprising:

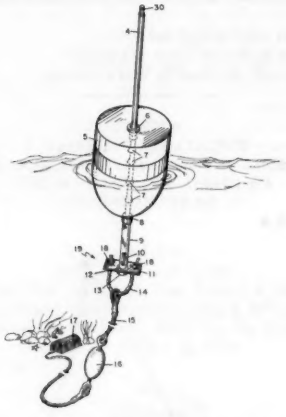
(a) an inflatable hull;
(b) starboard bracket means mounted to said hull on the starboard side thereof;
(c) port bracket means mounted to said hull on the port side thereof;
(d) bow bracket means mounted to said hull at the bow thereof;
(e) an A-frame with a substantially triangular upright body that terminates in a pair of rearwardly extending feet which are substantially perpendicular to said upright body, one of said extending feet received within said starboard bracket means and captively held to said hull by said starboard bracket means, the other of said extending feet received within said port bracket means and captively held to said hull by said port bracket means;
(f) a mast, one end of said mast configured to be captively held by said bow bracket means, a portion of said mast intermediate its ends captively mounted to the apex of said triangular body, said mast sloping obliquely upward from said bow bracket means to its mounting at said apex of said triangular body; and
(g) sail means carried by said mast.

4,249,277

LOBSTER BUOY SPINDLE

Emile Plante, 74 Badgers Island, Kittery, Me. 03904

Filed Sep. 15, 1978, Ser. No. 942,620
Int. Cl.[3] B63B 21/52
U.S. Cl. 9—8 R 5 Claims



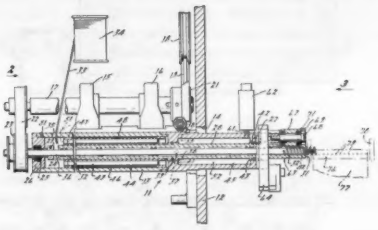
1. An improved lobster buoy spindle member of the type that is inserted into the central portion of a lobster buoy and extends above and below said buoy, comprising a buoy spindle having means for the retention of a float member thereon and having at the base thereof pivot means to allow rotation of a rope line extending from a trap when affixed thereto, wherein said pivot means is comprised of a pivot plate having a pivot plate aperture centrally defined therein into which the buoy spindle is inserted; a cap member formed at the bottom of the buoy spindle so as to retain the pivot plate thereon adapted so that said pivot plate can rotate on said spindle; and a line member extending and affixed from one side of said pivot plate to the other side of said pivot plate in a fashion so as to form a loop onto which said rope line from said trap can be affixed.

4,249,278

MACHINE AND METHOD FOR SPIRAL BINDING OF SHEET GROUPS WITH PLASTIC THREAD

Ernst Pfäffle, Neuffen, Fed. Rep. of Germany, assignor to Hans Sickinger Co., Pontiac, Mich.

Filed Jul. 13, 1979, Ser. No. 57,448
Int. Cl.[3] B42B 2/00
U.S. Cl. 11—1 A 12 Claims



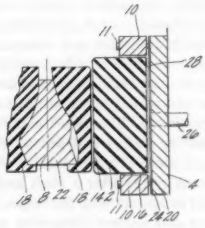
1. A method comprising the steps of taking a plastic thread from a bulk spool in a continuous manner, feeding the thread to a first section where it is heated and at the same time formed into a spiral, continuing to feed the heated thread while maintaining its spiral shape to a second section where the thread is cooled while still holding its shape, and continuing to feed the cooled thread into a perforated sheet group to form a spiral binder, said steps all being carried out in a continuous manner.

4,249,279

SHOE BACKPART MOLDING MACHINE

Gerhard Giebel, Neuenhain, Fed. Rep. of Germany, assignor to USM Corporation, Farmington, Conn.

Filed Oct. 3, 1979, Ser. No. 81,280
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1978, 7831063[U]
Int. Cl.[3] A43D 11/00
U.S. Cl. 12—54.3 12 Claims



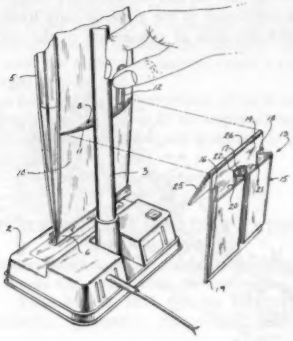
1. A backpart molding machine for molding the backpart of a shoe upper therewith, said machine comprising:
an inner form;
an outer form which, together with the inner form, molds the backpart of an upper therebetween, and which outer form comprises a pair of pivotable support portions, at least one mold cushion of elastic material and an air cushion arrangement formed between said support portion and said mold cushion, wherein each support portion has a block which is movable in a direction towards said inner form when the air cushion is inflated.

4,249,280

VACUUM CLEANER BAG ATTACHMENT

Gordon W. Goodrich, Grand Rapids, Mich., assignor to Oreck Corp., New Orleans, La.

Filed May 21, 1979, Ser. No. 40,512
Int. Cl.³ A47L 9/00
U.S. Cl. 15—323 **7 Claims**



2. In a vacuum floor cleaner:
(a) a base,
(b) an elongated rigid handle pivotally mounted to said base and extending generally vertically upwardly therefrom,
(c) a flexible expandable bag for receiving dirt and debris from the floor, said bag being connected between said base and said handle and co-pivotable with the latter,
(d) a removable caddy disposed on the handle side of said bag and extending across the width of the bag,
(e) and means for freely suspending said caddy from said bag,
(f) said caddy being supportingly confined between said bag and said handle,
(g) said caddy including a pair of spaced pockets forming a channel therebetween,
(h) and said channel being adapted to receive said handle therein to provide the said confinement of said caddy between said bag and said handle.

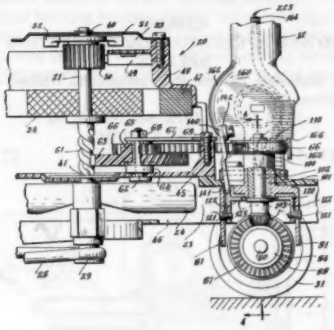
4,249,281

SELF-PROPELLED VACUUM CLEANER

Robert B. Meyer; Harold W. Schaefer, and Richard E. Kronmiller, all of Bloomington, Ill., assignors to National Union Electric Corporation, Greenwich, Conn.

Filed Jul. 30, 1979, Ser. No. 61,677
Int. Cl.³ A47L 9/00
U.S. Cl. 15—340 **11 Claims**

1. In a ground treatment apparatus having a body portion with ground engaging wheels and a motor, and an enlongated handle pivoted to said body portion for manual manipulation of said apparatus, and wherein coupling means are provided for coupling said motor to said wheels, manually operable control means are provided on said handle, and linking means are provided for controlling said first coupling means in response to said control means; the improvement wherein said coupling means comprises a common drive shaft for said wheels, first and second spaced apart gears having first and second drive faces respectively and being freely rotatably mounted on said shaft and coupled to said motor for continuous rotation in opposite rotational directions, and first and second clutch plates rotatable with said shaft and axially slidable thereon, said first and second clutch plates being positioned to be moved into and out of engagement with said first and second drive faces respectively, whereby only one of said faces can engage the respective clutch plates at any time and the clutch plates can be positioned at a neutral position with neither of them engaging its respective face, said linking means being a mechanical coupling and comprising means for selectively moving said clutch plates to engage said drive faces



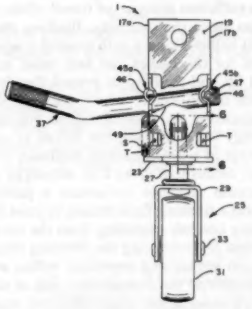
under the continuous control of said manually operable control means.

4,249,282

RETRACTABLE CASTER

Carl H. Little, Chautauqua, N.Y., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Jan. 21, 1980, Ser. No. 114,060
Int. Cl.³ B60B 33/06
U.S. Cl. 16—32 **9 Claims**



1. In a retractable caster assembly for rollingly supporting an object, such as a power tool or the like, thereby to enable the object to be readily moved on the floor, said caster assembly including a caster frame adapted to be rigidly secured to said object and a caster carried by the frame and movable relative thereto between a raised retracted position in which the caster is substantially free of the weight of the object and in which the object adjacent the caster assembly solidly bears on the floor and a lowered position in which said caster bears upon the floor and supports at least a part of the weight of the object, wherein the improvement comprises: said caster frame having a pair of spaced side walls, one of said side walls having a generally vertically extending slot therein, a bar pivotally secured to the other of said side walls, said bar extending from other said side wall through said slot in said one side wall and out beyond said one side wall, said slot having a generally vertical portion and another portion horizontally offset from said vertical portion, said caster having a stem slidably received within said caster frame and being cammingly engaged by said bar as said bar is pivotally moved downwardly within said slot thereby to effect movement of the caster relative to said caster frame toward its lowered position, with said caster

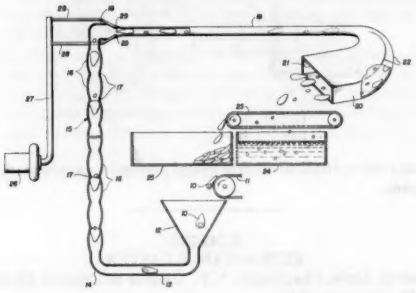
in its lowered position, said bar being movable in sidewise direction and from said vertical slot portion into said other slot portion thereby to lock said caster in its lowered position.

4,249,283

METHOD AND APPARATUS FOR EXTRACTING CLAM BELLIES

Gerald A. Blakeslee, Milton, Del., assignor to William J. Lawson, Milton, Del.

Filed Jul. 23, 1979, Ser. No. 59,742
Int. Cl.[3] A22C *29/04*
U.S. Cl. 17—51 **17 Claims**



1. A method of extracting bellies from marine mollusks with minimized damage to the resulting usable mollusk meat comprising subjecting shucked whole mollusks to a repetitive squeezing and sudden release massage action for a sufficient time and along a sufficient distance of travel of the mollusks to extract the bellies from the mollusks, flushing the separated mollusk meat and bellies along a path toward a separation and collection station for the bellies and said meat, and utilizing vacuum induced by said flushing to propel the shucked mollusks along a path of movement where they are subjected to said repetitive squeezing and sudden release massage action.

10. An apparatus for extracting the bellies of marine mollusks from the meat of whole shucked mollusks comprising a vacuum chamber, means to deliver a jet stream of pressurized fluid to the vacuum chamber to induce a partial vacuum therein and to form a flushing fluid stream beyond the vacuum chamber, a flushing conduit extending from the vacuum chamber in one direction and receiving the flushing fluid stream, a decelerator for said stream and separated bellies and mollusk meat entrained therein at the downstream end of said flushing conduit, a delivery conduit for whole shucked mollusks connected into said vacuum chamber and having multiple alternating bulbous portions and constrictions through which the whole mollusks are drawn by vacuum and are subjected to a rapid repetitive massage action prior to entering said fluid stream and conduit.

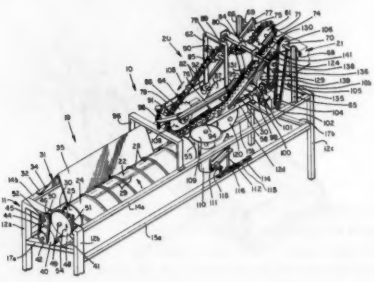
4,249,284

POULTRY GIZZARD PROCESSING SYSTEM

Kenneth Z. Graham, Rte. 2, Dawsonville, Ga. 30534, and Johnny R. Graham, Rte. 8, Gainesville, Ga. 30501

Filed Mar. 5, 1979, Ser. No. 17,155
Int. Cl.[3] A22C *21/00*
U.S. Cl. 17—52 **15 Claims**

1. A method of processing poultry gizzards comprising moving gizzards in sequence first along a horizontal path and then up an inclined path, wherein the step of moving the gizzards along the horizontal path includes the steps of placing the gizzards on a surface formed by a pair of elongated parallel side-by-side support surfaces defining a slot therebetween, with at least one of said support surfaces comprising a cylindrical drum with a spiral tread and with said other support surface comprising a rotatable rectilinear support bar including a portion thereof extending beyond the cylindrical drum with a spiral thread and rotating the cylindrical drum and the support bar about their longitudinal axes with the upper surfaces of the drum and support bar moving toward each other, moving the gizzards beyond the drum and supporting the gizzards on the rotatable support bar and on a stationary support bar extending parallel to the rotatable support bar, and engaging the gizzards from above the gizzards and urging the gizzards further along the rotatable support bar and the stationary support bar so that the entrails connected to the gizzards hang freely below the gizzards with the area of connection of the entrails to the



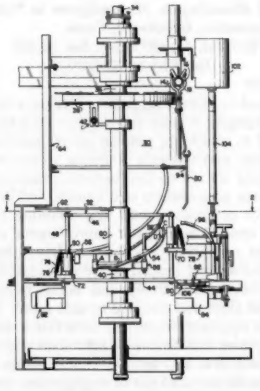
gizzards located below the gizzards, and cutting the entrails away from the gizzards, cutting upwardly into the lower portions of the gizzards where the entrails were connected to the gizzards at the intersection of the horizontal path and the inclined path as the gizzards move from the horizontal path to the upwardly inclined path, and after the gizzards have moved from the horizontal path of the upwardly inclined path spreading the cut apart portions of the gizzards and removing loose matter from the inside the gizzards as the gizzards move along the upwardly inclined path.

4,249,285

POULTRY KILLING METHOD AND MACHINE

Jerry D. Sheehan, Lee's Summit, and Donald J. Scheier, Kansas City, both of Mo., assignors to Simon-Johnson, Inc., Kansas City, Mo.

Filed May 31, 1979, Ser. No. 44,319
Int. Cl.[3] A22C *21/00*
U.S. Cl. 17—52 **22 Claims**



1. In a method of initial killing of birds without decapitation prior to further processing for use as they are advanced horizontally in a continuous train tendulously suspended by their

legs in a neck down position, said method including the steps of:

separately capturing the head of each suspended bird as the birds are advanced;

guiding the necks and bodies of the birds in a continuity of sequential progression along a curvilinear path of travel;

holding the captured heads against ascent as they are advanced horizontally along said path;

progressively and separately raising said bodies as they are advanced along said path to vertically stretch said necks longitudinally thereof between the captured heads and the bodies until the necks successively reach a condition of preselected tension; and

effecting a horizontal slit transversely of each neck during uninterrupted advancement of the captured heads and as the necks successively reach said condition of preselected tension.

4,249,286

FIBER SLIVER OPENING ROLL FOR AN OPEN-END SPINNING DEVICE

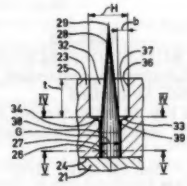
Herbert Stalder, Kollbrunn, Switzerland, assignor to Rieter Machine Works Ltd, Winterthur, Switzerland

Filed Jan. 18, 1979, Ser. No. 4,737

Claims priority, application Switzerland, Feb. 1, 1978, 1093/78

Int. Cl.³ D01G *15/14*

U.S. Cl. 19—97 **12 Claims**



1. A fiber sliver opening roll for an open-end spinning device, comprising:

means providing a substantially cylindrical body for receiving needles, said body having a radially outwardly facing surface;

a plurality of needles each having a needle point and a needle shaft;

means for mounting each of the needles at the cylindrical body such that the needle points of the needles protrude from said surface of the cylindrical body;

said mounting means comprising for each needle:

an outer, wide recess in said surface of a size sufficient to clear the related needle at all sides;

said recess being provided with a side wall and a base;

a bore smaller than said recess located below said recess; and

said bore securely fixing the needle shaft of the needle.

4,249,287

TAB BUCKLE

Roy W. Tadd, 34091 Aurelio Dr., Dana Point, Calif. 92629

Filed Oct. 3, 1979, Ser. No. 81,349

Int. Cl.³ A44B *1/14, 11/00*

U.S. Cl. 24—113 R **9 Claims**

1. A tab buckle for a tab on a pair of trousers comprising:

a body member including a front panel having forward and rear faces;

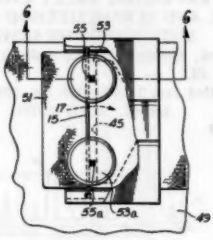
a first latching member;

said body member including first and second mounting sections spaced apart on said rear face of the body member and projecting outwardly from said rear face of the body member;

means for attaching longitudinally spaced regions of the first latching member to the first and second mounting sections, respectively, with the first latching member being on the same side of said body member as said rear face and being spaced from said rear face of the body member over a major length of the first latching member;

a second latching member having a locking edge;

resilient means for attaching the second latching member to the body member with the second latching member being on the same side of said body member as said rear face and



with the locking edge being adjacent the first latching member;

said resilient means resiliently resisting movement of the second latching member away from the first latching member whereby the locking edge and the first latching member can resiliently grip an element; and

said resilient means resiliently resisting translation of the second latching member in at least one direction away from the first latching member.

4,249,288

APPARATUS FOR TREATING FABRIC BY BEATING WHILE FABRIC IS IN THE SPREAD OR FLATTENED STATE

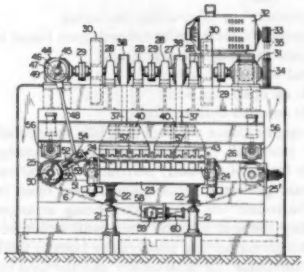
Shozo Iwata, 44, Aza Kitagawara, Menjo, Yamatocho, Ichinomiya-shi, Japan

Filed Mar. 19, 1979, Ser. No. 22,062

Claims priority, application Japan, Mar. 27, 1978, 53-35019

Int. Cl.³ D06C *17/04, 15/14, 27/00*

U.S. Cl. 26—22 **2 Claims**



1. An apparatus for beating a fabric while the fabric is in a spread or flattened state, comprising: an anvil bed; means for resiliently supporting said bed for free adjustment of level; a pair of guide rolls disposed at respective sides of said anvil bed; a plurality of beating anvils disposed side by side on said anvil bed and between said guide rolls; an endless rubber base for transferring or feeding a fabric stretched between said guide rolls; a plurality of beating bars of polygonal cross section disposed above said beating anvils and said rubber base in vertical alignment with said beating anvils; eccentric crank means for vibrating said beating bars in the vertical direction; and drive coupling means including a one-way clutch adapted

to operatively connect said means for vibrating said beating bars to one of said guide rolls, so as to drive said rubber base such that the transfer or feed of the fabric is stopped when said beating bars are lowered to beat said fabric and that said fabric is transferred or fed when said heating bars are moving upward from said fabric.

4,249,289

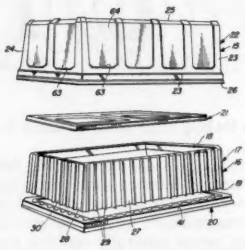
COMBINATION BURIAL VAULT AND CASKET AND FUNERAL AND BURIAL METHOD OR SYSTEM EMPLOYING THE SAME

Gerald L. Work, Spokane, Wash., assignor to Wilbert, Inc., Forest Park, Ill.

Filed Jan. 3, 1980, Ser. No. 109,346

Int. Cl.³ A61G *17/00*

U.S. Cl. 27—35 **22 Claims**



1. A combination burial vault and casket comprising:

(a) a burial vault comprising

(1) a base including

a. a generally rectangular-shaped flat supporting platform which supports the bottom wall of the base of the vault;

b. a generally rectangular-shaped box-like upright inner wall structure mounted on and attached to the said supporting platform and including

(1) side walls; and

(2) end walls; and having

(a) an open top; and

(b) an open bottom which is closed by the said supporting platform or bottom wall of the base of the vault;

(b) a "surround" or false casket including

(1) a generally rectangular-shaped open frame including

a. front and rear side walls; and

b. end walls; and having

(1) an open top; and

(2) an open bottom; and

(2) a top or closure member hingedly connected to the said rear side wall of the said generally rectangular-shaped open frame of the said "surround" or false casket;

(c) the said generally rectangular-shaped open frame of the said "surround" or false casket being arranged over and enclosing the said upright inner wall structure of the said base and its supporting platform or bottom wall;

(d) the "surround" or false casket and the said inner upright wall structure of the said base and the said supporting platform or bottom wall cooperating to provide a casket assembly in which the remains of the deceased are rested during visitation and the funeral service at the funeral home;

(e) latching means for releasably latching the said generally rectangular-shaped open frame of the said "surround" or false casket to the said upright inner wall structure and the said supporting platform of the said base;

(f) a closure lid member adapted to be arranged over and to close the said open top of the said upright inner wall structure of the said base to close the same after the close of visitation and the funeral services at the funeral home;

(g) means for hermetically sealing the said closure lid member over the said open top of and to the said upright inner wall structure of the said base of the vault;

(h) the said "surround" or false casket being adapted to be unlatched by the said latching means from the said upright inner wall structure and its aforesaid supporting platform or bottom wall after the close of visitation and the funeral service at the funeral home and retained at the funeral home for reuse;

(i) a dome-shaped member adapted to be arranged over and to enclose the said upright inner wall structure of the said base and its aforesaid supporting platform or bottom wall after removal of the said "surround" or false casket from the said upright inner wall structure and its aforesaid supporting platform or bottom wall at the funeral home;

(j) means for hermetically sealing the said dome-shaped cover member to the said upright inner wall structure and its aforesaid supporting platform or bottom wall; and

(k) means for mechanically fastening the said dome-shaped cover member to the said upright inner wall structure and its aforesaid supporting platform or bottom wall.

4,249,290

CONTROLLED DEFLECTION ROLL

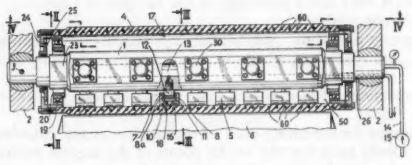
Rolf Lehmann, Rudolfstetten, Switzerland, assignor to Escher Wyss Ltd., Zurich, Switzerland

Filed Feb. 10, 1978, Ser. No. 876,632

Claims priority, application Switzerland, Feb. 17, 1977, 1967/77

Int. Cl.³ B21B *13/02*

U.S. Cl. 29—116 AD **10 Claims**



1. A controlled deflection roll comprising:

a stationary support;

a substantially tubular-shaped flexible roll shell;

means for mounting said substantially tubular-shaped roll shell to be rotatable about said stationary support;

a plurality of movable pressure elements for supporting said roll shell;

said pressure elements being arranged in a pressure plane and movable in such pressure plane relative to the support for exerting a pressure force;

means for fixedly retaining the roll shell at its ends against movement in a direction substantially perpendicular to the pressure plane;

at least one device for enabling and limiting lateral deformation of the roll shell in a direction substantially perpendicular to the pressure plane arranged at said stationary support and mounted stationarily with respect thereto externally of the pressure plane;

said roll shell having an inner surface;

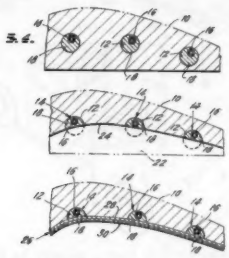
said at least one device being provided with an impact surface cooperating with said inner surface of said roll shell at a location externally of the pressure plane.

4,249,291

METHOD FOR FORMING A LIQUID COOLED AIRFOIL FOR A GAS TURBINE

Clayton M. Grondahl, Clifton Park; Leo C. Willmott, Ballston Spa, and Myron C. Muth, Amsterdam, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 1, 1979, Ser. No. 44,538
Int. Cl.[3] B23P *15/04*
U.S. Cl. 29—156.8 H 10 Claims



1. A method for forming a liquid cooled airfoil for a gas turbine, comprising the steps of:

(a) forming a plurality of holes at spaced locations in an oversized airfoil blank;

(b) bonding a pre-formed composite liquid coolant tube in each of said holes, said composite tube including an inner member formed of an anti-corrosive material and an outer member formed of a material exhibiting a high degree of thermal conductivity;

(c) machining said airfoil blank to a desired shape, the location of said holes being such that a portion of said outer member of each of said composite tubes is contiguous with the outer surface of said machined airfoil blank after machining; and

(d) bonding an external skin to said outer surface of said machined airfoil blank and said portion of said outer member of each of said composite tubes.

4,249,292

METHOD OF ASSEMBLING SELF-CLEANING HELICAL SPRING FILTER

Reynaldo Calderon, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

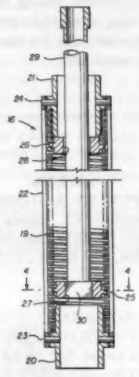
Division of Ser. No. 944,952, Sep. 22, 1978, Pat. No. 4,180,463.
This application Jun. 4, 1979, Ser. No. 44,896
Int. Cl.[3] B23P *15/16*
U.S. Cl. 29—163.5 CW 5 Claims

1. A method for assembling a self-cleaning helical spring filter comprising,

(a) inserting a ring shaped cleaner between two convolutions at one end of a helical tension spring,

(b) connecting each end of the helical tension spring of a predetermined diameter and length to the opposite ends of an elongated perforated outer sleeve for spacing apart all spring convolutions by a predetermined distance, and

(c) forming a connecting means on the ring shaped cleaner for being connectable to a rotatable elongated bar for rotating the ring shaped cleaner between all of the spring convolutions to the spring other end for scraping off



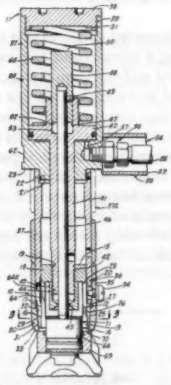
foreign material from between the spaced apart spring convolutions.

4,249,293

PULLING TOOL

Harvey I. Schulberg, 16100 S. Avalon Blvd., Gardena, Calif. 90248

Filed Apr. 9, 1979, Ser. No. 28,101
Int. Cl.[3] B23P *19/04*
U.S. Cl. 29—252 25 Claims



1. A tool for pulling a subject element from an anchorage and having a forward end and a rear end, including a gripping member located at the forward end and movable under pressure along a defined pulling path towards the rear end, the gripping member having at least two limbs between which limbs the subject element is receivable, the limbs being movable relative to each other in a direction transverse the pulling path, retaining means located outside of the gripping member, the retaining means defining an inner wall coacting with the outer wall of at least one of the limbs of the gripping member in a position of the gripping means retracted from the front thereby urging the relative inward contraction of the limbs such contraction providing a transverse force from the limbs on the subject element, the outer wall of the gripping means having at its leading end an external step adapted to react with the inner wall of the retaining means, the step having an interacting surface substantially parallel to the pulling path and the

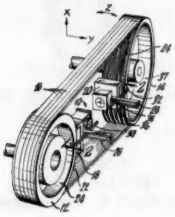
inner wall of the retaining means, and the retaining means providing an edge adapted to react against the anchorage from which the subject element is pulled, pressure generating means, and connector means linking the pressure generating means with the gripping element to permit movement of the gripping element between the forward end and a position rearwardly of the forward end.

4,249,294

OPTICAL PULLEY ALIGNMENT TOOL

Flavio Belfiore, 36 Maybury Ct., Staten Island, N.Y. 10306

Filed Jun. 28, 1979, Ser. No. 52,803
Int. Cl.³ B25B *27/14*
U.S. Cl. 29—271 **5 Claims**



1. An optical alignment device for aligning pulleys comprising:

(a) first and second members releasably attachable to each of said pulleys;

(b) target means mounted to one of said members, said target means including a vertical and horizontal alignment indicia; said vertical and horizontal indicia being parallel to the vertical and horizontal centerline of said pulley;

(c) optical viewing means, said optical viewing means mounted to the other of said members and including vertical and horizontal alignment indicia parallel to the vertical and horizontal centerline of said other pulley; and

(d) said target means being viewable in said viewing means to permit alignment of said pulleys when said alignment indicia on said viewing means are superimposed on said alignment indicia on said target means.

4,249,295

METHOD OF MOUNTING A TOOL BOX ON A TRUCK

Bill W. Lance, 735 Concord Ave., San Jose, Calif. 95128

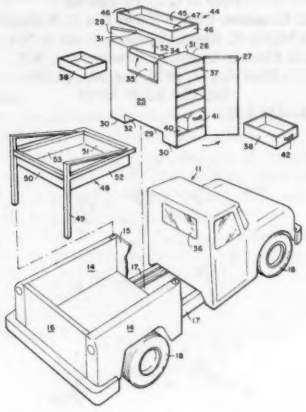
Filed Mar. 19, 1979, Ser. No. 21,788
Int. Cl.³ B23P *17/00*
U.S. Cl. 29—416 **6 Claims**

1. The method of mounting a tool box on a truck having a passenger cab and a frame supporting a bed positioned behind and adjacent to the cab and formed of a front wall, side walls and a bottom mounted on the frame, said method comprising the steps of:

removing a forward portion of the bed side walls and the bed front wall adjacent the cab;

placing a tool box adjacent the cab and extending across the bed in the position of the removed portions of the side walls, said tool box having side walls approximately coplanar with the bed side walls;

locating storage compartments in at least one of said side walls of said tool box whereby tools can be retrieved from the side of the truck; and



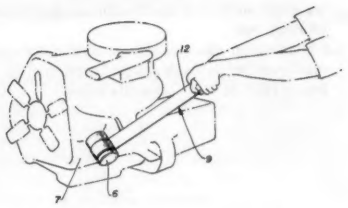
reinstalling the bed front wall in a position rearward of the tool box and joining the side walls remaining after the forward portions are removed.

4,249,296

OIL FILTER REMOVING TOOL AND METHOD

Michael R. Colburn, Hayward, Calif., assignor to Larry Telles, San Lorenzo, Calif., a part interest

Filed Aug. 24, 1978, Ser. No. 936,528
Int. Cl.³ B23P *19/02*
U.S. Cl. 29—426.1 **1 Claim**



1. The method of removing a cylindrical oil filter canister threadably attached to an engine block in proximity to other engine parts using an elongated flat belt-like member having a closed loop slip connector providing a continuously variable sized loop adjacent a first end of said member, said member having a length at least several times the circumference of the canister so as to dispose the opposite end of said member remote from said canister and engine parts with said loop surrounding said canister, comprising the following steps:

adjusting the size of said loop to fit around said canister with said member in said loop extending from said slip connector in a wrapping direction opposite to the unthreading direction of said canister from said block and providing a first turn around said canister;

reversing the direction of wrapping of said opposite end of said member to overlap said turn in said reverse direction to provide overlapped turn portions and at least a substantially one-half second turn coming off said canister tangentially thereto in a reverse direction coinciding with the direction of unthreading of said canister from said block;

manually engaging said member remote from said canister and tensioning said member to compress said overlapped turn portions against each other and said canister and to

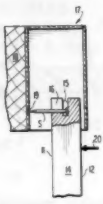
apply rotational torque to said canister in said last-named direction.

4,249,297

NAILING TOOL AND METHOD OF NAILING

John V. Waters, 37 Bay Pines Rd., Hilton Head Island, S.C. 29928

Filed Aug. 30, 1979, Ser. No. 70,764
Int. Cl.³ B25C *1/02*
U.S. Cl. 29—432 **8 Claims**



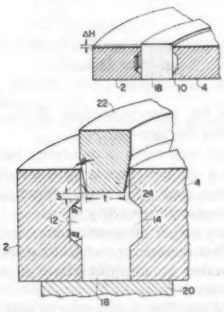
8. A method of driving a nail into an object immediately adjacent one side of an enclosed space comprising the steps of engaging the head of the nail in a first slot extending from one end of an elongated bar transversely and axially of said bar in a spaced and parallel relationship to an exterior striking surface extending longitudinally of the bar and adapted to receiving hammering blows with the shank of the nail supported in a second slot extending axially of said bar from said one end perpendicular to said first slot between said first slot and an exterior surface of the bar opposite said striking surface with the shank protruding forwardly of said opposite bar surface perpendicular to the axis of the bar, positioning the tool to place the slotted end portion of said bar and engaged nail within the enclosed space with the nail in alignment with its final driven position and the pointed nail end adjacent the object to be penetrated, and bringing a hammering means into striking contact with that portion of said bar striking surface as lies outside said enclosed space to drive the nail into the object.

4,249,298

METHOD FOR CONNECTING TWO MEMBERS

Hisanobu Kanamaru, Katsuta; Hideo Tatsumi, Mito; Moisei Okabe, Hitachi, and Akira Tohkairin, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 27, 1979, Ser. No. 24,383
Claims priority, application Japan, Mar. 27, 1978, 53/34192
Int. Cl.³ B21D *39/00*; B23P *11/00*
U.S. Cl. 29—520 **15 Claims**



1. A method for connecting two members to be connected by means of another connecting member comprising:

(a) forming a circumferential groove on connecting surfaces of each of first and second members to be connected;

(b) forming roughness on an inner surface of the circumferential groove of each of the first and second members;

(c) positioning said first and second members so as to define a gap therebetween bounded on opposite sides by the connecting surfaces of the first and second members;

(d) placing a connecting member in the gap between the connecting surfaces of the first and the second members to be connected, the connecting member being made of a material which has a lower resistance to plastic deformation than that of which the first and the second members to be connected are formed and has a required mechanical strength; and

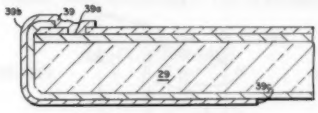
(e) pressing and plastically deforming the connecting member in a manner whereby the circumferential groove and the roughness are filled with the connecting member.

4,249,299

EDGE-AROUND LEADS FOR BACKSIDE CONNECTIONS TO SILICON CIRCUIT DIE

Craig P. Stephens, Carlsbad, and James C. Rill, Del Mar, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 791,768, Apr. 28, 1977, abandoned.
This application Mar. 5, 1979, Ser. No. 17,794
Int. Cl.³ B01J *17/00*
U.S. Cl. 29—578 **6 Claims**



1. A method of forming contacts on a semi-conductor circuit die having first and second major surfaces and at least one straight side, with a circuit and conductors being contained on at least a first of the major surfaces , comprising the steps of:

(a) removing corner edge portions from the die at the intersection of each of its major surfaces with the one side;

(b) applying an insulating layer of uniform thickness around the one side; and

(c) forming a plurality of contact strips extending from the conductors on the first major surface, over the insulating layer, around the one side, and to the second surface by depositing metal in uniform thickness from a source onto masked areas of the die while turning the die relative to the source.

4,249,300

METHOD OF MANUFACTURING A CIRCULAR WAVE GUIDE AND INSTALLING THE SAME

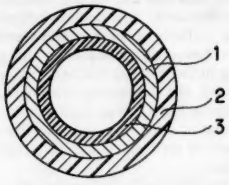
Michel Sirel, Paris, France, assignor to Les Cables de Lyon, Lyon, France

Filed Jun. 2, 1978, Ser. No. 912,141
Claims priority, application France, Jun. 10, 1977, 77 17816
Int. Cl.³ H01P *11/00*
U.S. Cl. 29—600 **1 Claim**

1. A method of manufacturing a circular wave guide and installing the same for the propagation of waves having field lines which are orthogonal to the wall and extending, in lengths greater than six meters, said wave guide comprising a metal conductor tube and a covering of plastic material, and being sufficiently flexible to be capable of being wound on a drum, said method comprising the steps of:

providing inside said metal conductor tube reinforcing means of tubular or cruciform shape formed of a plastic material shrinkable upon heating, before winding said wave guide on a drum and installing said wave guide in its final operative position, and

heating said heat shrinkable reinforcing means by flowing internally of said tube and along said reinforcing means a draft of hot air, and



removing said shrunk reinforcing means from the inside of said tube.

4,249,301

METHODS FOR MANUFACTURING MAGNETIC TRANSDUCING HEADS

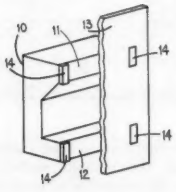
John R. Cartwright, Letchworth, England, assignor to Data Recording Instrument Company Limited, Staines, England

Filed Aug. 10, 1979, Ser. No. 65,616

Claims priority, application United Kingdom, Aug. 23, 1978, 34291/78

Int. Cl.³ G11B *5/42*

U.S. Cl. 29—603 **9 Claims**



1. A method of manufacturing a magnetic core for a magnetic transducing head including the steps of providing a first magnetic member of ferrite material with a first planar surface; providing a layer of masking material having a predetermined thickness at each of two spaced apart positions on the first planar surface leaving a portion of the planar surface exposed; subjecting the exposed portion of the planar surface and the masking layers to an eroding action by an ion beam to remove material from the surface of the masking layers and from the exposed portion of the planar surface to produce a new planar surface on the first magnetic member and a spacer at each of said positions projecting from said new planar surface consisting at least partly of the ferrite material of the first magnetic member, the height of the spacers being determined by the relative rates of erosion of the ferrite material and masking material and by the predetermined thickness of the layer of masking material; then assembling the first magnetic member with a second magnetic member utilising the spacers to form a non-magnetic gap between the first and second members; bonding the members together with a glass material which fills the non-magnetic gap between the members and machining the assembly to remove the spacers.

4,249,302

MULTILAYER PRINTED CIRCUIT BOARD

Philip C. Crepeau, San Diego, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 28, 1978, Ser. No. 974,164

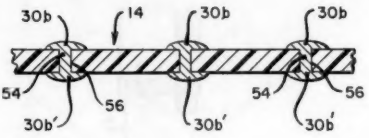
Int. Cl.³ H05K *1/12, 1/14*

U.S. Cl. 29—830 **4 Claims**

1. A method for producing a multilayer printed circuit board having a reduced amount of surface area on the multilayer printed circuit board required for electrical contact between the layers and, in turn, an increased amount of surface area on the multilayer printed circuit board available for routing printing conductor patterns, comprising:

providing a plurality of signal layers, each signal layer having a pattern of conductive pads and a pattern of printed conductors, the pads formed by

perforating the signal layers to make apertures on each signal layer corresponding to the pattern of conductive pads, and



depositing conductive material at the apertures using plated-through hole steps so that pads are formed on opposite sides of each signal layer at each aperture and a connecting portion extends through each aperture electrically connecting the pads; and then

releasably securing the signal layers to each other so that the pads on one of the signal layers directly contact the corresponding pads on an adjacent one of signal layers.

4,249,303

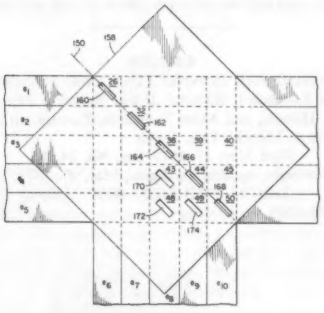
METHOD FOR ELECTRICAL CONNECTION OF FLAT CABLES

Karl Weinmann, Watchung; Ted L. C. Kuo, Fanwood, and William S. Greenwood, Nutley, all of N.J., assignors to Thomas & Betts Corporation, Raritan, N.J.

Filed May 25, 1979, Ser. No. 42,440

Int. Cl.³ H01R *43/00*

U.S. Cl. 29—868 **6 Claims**



1. A method for interconnection of flat multiconductor cables, comprising the steps of:

(a) placing one such cable in overlying relation to another such cable in manner providing a matrix of connection zones wherein each zone has a unique pair of cable conductors in registry therewith;

(b) selecting an origin connection zone having in registry therewith first conductors of said cables and precluding from connection use all other zones in registry with said first conductors;

(c) perforating said first conductors at said origin zone and making electrical connection therebetween;

(d) providing for selection plural zones in registry with a second conductor of one of said cables and precluding

from connection use all other zones in registry with said second conductor;

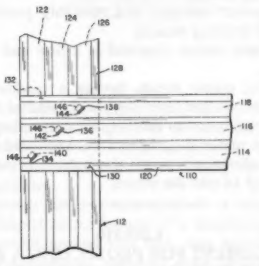
(e) selecting further zones for perforation and connection of conductors until connections are made to all conductors of at least one of said cables, each such further zone being selected from the group of zones which do not have in registry therewith any conductor in registry with any previously selected zone.

4,249,304

METHOD OF CONNECTING FLAT ELECTRICAL CABLES

Karl Weinmann, Watchung, and Ted L. C. Kuo, Fanwood, both of N.J., assignors to Thomas & Betts Corporation, Raritan, N.J.

Filed May 25, 1979, Ser. No. 42,369
Int. Cl.³ H01R *43/00*
U.S. Cl. 29—872 **11 Claims**



1. A method for connecting a first flat electrical cable having first conductors within electrical insulation to a second flat electrical cable having second conductors within electrical insulation, comprising the steps of:

(a) providing perforations separately in said first and second cables, each perforation extending through such conductor interiorly of opposed side margins thereof;

(b) arranging said cables such that said first conductors overlap said second conductors with selective of said perforations in said first conductors in registry with selective of said perforations in said second conductors; and

(c) introducing an electrically conductive member into each such registered perforations and crimping said member onto insulation of both said first and second cables to provide electrical connection of said first and second connectors, each said member being preselected to have insulation piercing expanse disposed interiorly of said side margins of said first and second conductors in member crimped condition.

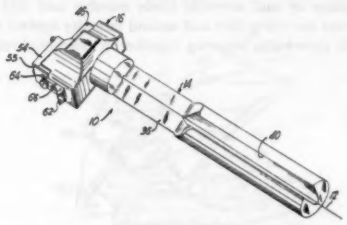
4,249,305

TOOL FOR USE IN CLEAVING FIBER OPTIC ELEMENTS

Rocco F. Basile, Roselle, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Mar. 5, 1979, Ser. No. 17,345
Int. Cl.³ B26F *3/00*
U.S. Cl. 30—164.9 **16 Claims**

1. In a tool for use in cleaving a fiber optic element into first and second portions, including a support means having a longitudinal axis for supporting a fiber optic element along said longitudinal axis, grooving means for forming a groove in the surface of the fiber optic element, engagement causing means for causing engagement of said grooving means with the fiber optic element, said engagement causing means being movable between a first position in which said grooving means is adapted to engage the fiber optic element and a second position in which said grooving means is adapted to be spaced from the fiber optic element, and mounting means for mounting said grooving means for rotational movement relative to said support means, the improvement wherein said engagement causing means comprises an auxiliary support member having a supporting portion for supporting said fiber optic element along a portion of its longitudinal length, mounting means for



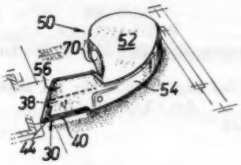
mounting said auxiliary support member for movement in a direction transverse to the direction of said longitudinal axis of said support means, and moving means for displacing said supporting portion of said auxiliary support member into position offset from said longitudinal axis of said support means in a direction towards said grooving means.

4,249,306

ERASING KNIFE

Bengt A. Benson, Styckjunkargatan 5, 114 34 Stockholm, Sweden

Filed Sep. 10, 1979, Ser. No. 73,984
Int. Cl.³ B26B *1/00*
U.S. Cl. 30—169 **10 Claims**



1. An erasing knife having a substantially straight knife edge (**18**, **20**) intended for erasing by scraping or cutting, accommodated in a holder means (a so-called dispenser) suitable for its manipulation, characterized by a thin metal strip (**10**, FIG. **1**), preferably of hardened carbon steel, which is ground sharp along at least one edge (**12**) and at least in part formed to a uniformly bent tongue (**16**) terminating in a substantially flat end piece (**18**) with its sharp edge (**20**) forming an active erasing edge of the erasing knife, the end piece (**18**) of the knife being kept slightly twisted by the dispenser (**50**) in relation to the tongue portion of the strip, so that said flat end piece forms a predetermined, acute angel (α) with a normal to a plane coinciding with the sharp edge (**12**) of said tongue portion (**16**).

4,249,307

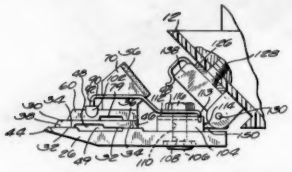
HAIR CLIPPER

Matthew L. Andis, Racine, Wis., assignor to Andis Company, Racine, Wis.

Filed Jun. 19, 1978, Ser. No. 916,511
Int. Cl.³ B26B *19/06*
U.S. Cl. 30—216 **23 Claims**

1. A hair clipper comprising a housing. a motor located in said housing and including a shaft having a drive member thereon, and a blade set connected to said housing and including a lower blade connected to said housing, a movable upper blade member having a forward edge with a series of teeth extending therealong, and an upper surface extending from

said forward edge, a shoe member including a planar body having an upper surface, and a groove formed in said upper surface, a notch in said planar body and first and second wall portions on opposite sides of said notch and extending upwardly from said upper surface and in laterally spaced parallel relation to each other, a driven element secured between said upper surface of said movable blade member and said shoe member and including first and second laterally spaced walls, and means detachably securing together in assembled relation



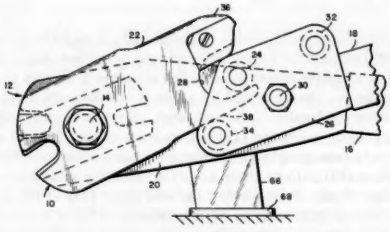
said blade member, said driven member, and said shoe member, with said driven member first and second laterally spaced walls extending upwardly through said notch, said first spaced driven element wall located adjacent one of said first and second wall portions and said second spaced driven element wall located adjacent the other of said first and second wall portions, said spaced driven element walls being engaged by said drive member to cause reciprocating movement of said movable blade assembly relative to said first blade.

4,249,308

BOLT CUTTER

Alfred Z. Boyajian, P.O. Box 811, Manhattan Beach, Calif. 90268

Filed Aug. 20, 1979, Ser. No. 68,083
Int. Cl.³ B26B *13/00*
U.S. Cl. 30—231 **14 Claims**



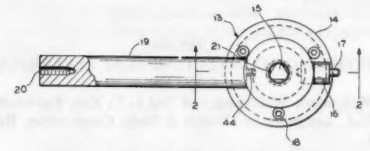
1. A shearing device comprising jaws, means pivotally connecting the jaws, handles connected to the jaws for effecting pivotal movement, said jaws having confronting planar surfaces normal to the pivot axis about which they pivot, said planar surfaces containing blade-receiving recesses open at the distal ends of the jaws, said recesses defining spaced, parallel, force-transmitting elements spaced from said pivot axis and blades dimensioned to be snugly received in the recesses between the force-transmitting elements in surface engagement for pivotal movement about said pivot axis with the jaws, said blades having notched ends defining cutting edges arranged to be moved in opposite arcuate directions about said pivot axis relative to each other to effect cutting and wherein the force couple developed by pivotal movement of the jaws is transmitted to the opposite ends and opposite sides of the blade.

4,249,309

ROTATING NIBBLER APPARATUS

Edward J. Karr, West Chicago, Ill., assignor to B. W. Darrah, Inc., Carol Stream, Ill.

Filed Jul. 23, 1979, Ser. No. 59,944
Int. Cl.³ B23D *27/00*
U.S. Cl. 30—240 **15 Claims**



1. A rotating nibbler apparatus for shearing sheet material comprising:

shaft housing means;

a shaft member operably and rotatably positioned within said shaft housing means;

rotating cutter means attached at a first end of said shaft member,

said rotating cutter means having a modified sinusoidal groove therein for receiving sheet material therein;

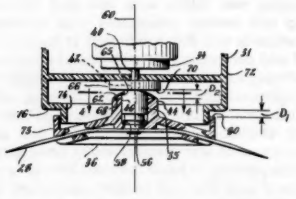
die means positioned to receive said cutter therein whereby said sheet material is sheared between said cutter means and said die means when the bottom of said groove is juxtaposed to said die means.

4,249,310

ARRANGEMENT FOR PROTECTING A ROTARY DEVICE FROM IMPACT THRUST FORCES

Ralph J. Secoura, Baltimore, and Thomas J. Howard, Jr., White Marsh, both of Md., assignors to Black & Decker, Inc., Towson, Md.

Filed Aug. 21, 1978, Ser. No. 934,745
Int. Cl.³ A01D *50/00*
U.S. Cl. 30—276 **10 Claims**



1. In a prime mover having a rotary output shaft, an arrangement for inhibiting movement of the shaft in an axial direction upon application of a force to a body positioned on the shaft comprising:

(a) a first body;

(b) means for mounting said first body to said output shaft for rotation therewith and for movement of said first body in an axial direction on said shaft when a thrust force is applied to said body;

(c) a second housing body which is stationary;

(d) said first and second bodies spaced apart in an axial direction and including means for providing mutual engagement therebetween upon the application of a force to said first body, said engagement means restricting movement of said first body in an axial direction upon engagement with said housing body and transferring to said housing body a force applied to said first body;

(e) said housing body adapted to receive a force in said axial direction which is transferred thereto without applying said force in an axial direction to said shaft; and,

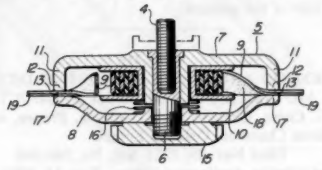
(f) means for biasing apart said first and second bodies for

inhibiting engagement therebetween during rotary motion of said shaft and for enabling engagement when an axial force is applied to said first body.

4,249,311
GRASS CUTTING APPARATUS

Hisashi Inaga, Tokyo, Japan, assignor to Kioritz Corporation, Japan

Filed Apr. 26, 1979, Ser. No. 33,622
Claims priority, application Japan, Feb. 17, 1979, 54-18434[U]
Int. Cl.³ A01D *50/00*
U.S. Cl. 30—276 **1 Claim**



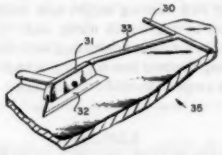
1. A grass cutting apparatus comprising:
(a) a rotary casing having a hub portion and including an upper member and a lower member;
(b) a rotary shaft extending in and through said upper and lower members;
(c) a reel loosely fitted around said hub of said casing;
(d) a belt-shaped cutter formed of a macromolecular compound wound around said reel, said belt-shaped cutter having a rectangular shape of small thickness in cross section and pointed edges at opposed short sides thereof; and
(e) means pressing said upper and lower members together toward each other and securing said upper and lower members on said shaft so as to be operative to rotate with said shaft as a unit;
wherein one of said upper and lower members of said casing includes a peripheral wall forming at least one supply port with an adjacent edge of the other of said upper and lower members through which said belt-shaped cutter extends outwardly from said rotary casing when paid out of said reel with its long sides disposed horizontaliy to move in a grass cutting plane as a servicing portion swung by rotation of said rotary casing, said means pressing said upper and lower members together toward each other also being effective to press said belt-shaped cutter between said upper and lower members thereby holding said belt-shaped cutter in place in said supply port, and said reel is effective to wind up said belt-shaped cutter when desired.

4,249,312
LEAD CHOPPER

Ronald I. Christy, 26615 Ocean View Dr., and Martin L. Anderson, 4347 Hillview Dr., both of Malibu, Calif. 90265

Division of Ser. No. 916,774, Jun. 19, 1978. This application Apr. 9, 1979, Ser. No. 28,507
Int. Cl.³ B23D *35/00*
U.S. Cl. 30—315 **1 Claim**

1. A tool for cutting soft ductile material which is positioned on a substantially flat surface, by rapidly accelerating a thin blade through the material using a hand-held hammer to eliminate distortion from cutting, said tool comprising:
a thin holder for holding replaceable blades;
a blade disposed in said holder;
a short rod attached to one end of said blade holder extending back in a direction parallel to the plane of the blade;
a short cross bar attached to the end of said rod opposite the blade holder and perpendicular to both said rod and the plane of the blade, said cross bar being adapted to lie on said flat surface and adapted to orient the blade perpendicular to the surface;
the tool being adapted to rest on the flat surface with the blade edge parallel to and in contact with the flat surface, and the cross bar resting on the surface, maintaining the blade perpendicular to the flat surface; whereby when

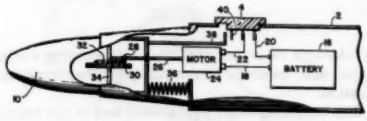


using said tool, the cross bar is held down on the surface and the blade holder and blade are lifted up over the piece to be cut; and with the blade resting on the piece to be cut, a hammer is used to strike the blade holder directly over the blade, accelerating the blade through the piece to be cut.

4,249,313
PRUNING DEVICE

Richard G. H. Bates, 2638 N. 80th Pl., Scottsdale, Ariz. 85257

Filed Aug. 17, 1979, Ser. No. 67,341
Int. Cl.³ B27B *9/00*
U.S. Cl. 30—391 **10 Claims**

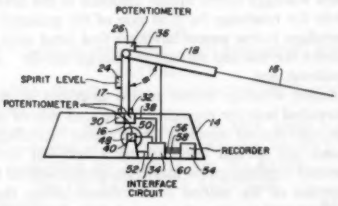


1. A portable pruning device for pruning stems, limbs and the like, comprising:
a housing;
a saw blade mounted within said housing and extending outward therefrom;
a guard shield telescopically mounted within said housing for shielding said saw blade until said guard shield is urged into said housing; and
first means for automatically rotating said saw blade when said guard shield is urged into said housing.

4,249,314
DIVER OPERATED BOTTOM SURVEY SYSTEM

Earl J. Beck, 3045 Grove St., Ventura, Calif. 93003

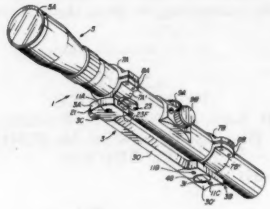
Continuation-in-part of Ser. No. 272,599, Jul. 17, 1972, abandoned. This application Jan. 17, 1975, Ser. No. 541,897
Int. Cl.³ G01B *5/28*
U.S. Cl. 33—1 H **5 Claims**



1. A diver operated bottom surveying system suited for use under conditions of poor light and surf comprising:

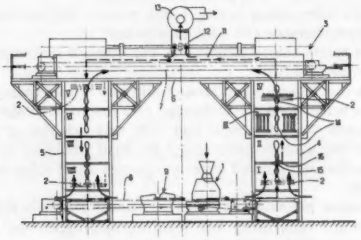
a. a stadia vertically placed at a point for which the elevation is desired;
b. an instrument case vertically positioned on a known bench mark;
c. a movable direction rod secured to said instrument case;
d. a retractable cable extending from the case and through said direction rod, said cable being attached to said stadia;
e. means on said direction rod and in said instrument case for sensing the two bearing angles and radius of said stadia with respect to said bench mark; and
f. means in said case communicating with said sensing means for recording the two bearing angles and the radius of said stadia with respect to said bench mark.

4,249,315
GUN SCOPE MOUNT SYSTEM
Walter G. Hopson, III, 4221 E. Irving Cir., Tucson, Ariz. 85711
Filed Jun. 29, 1979, Ser. No. 53,390
Int. Cl.[3] F41G *1/38*
U.S. Cl. 33—250 **8 Claims**



1. A telescope mounting apparatus for mounting a telescope on a gun, said telescope mounting apparatus comprising in combination:
a. a first mounting block rigidly attached to the receiver or barrel of the gun, said first mounting block having therein a circular female dovetail recess;
b. a second mounting block rigidly attachable to a receiver or barrel of the gun at a distance from said first mounting block, said second mounting block having a flat top surface and first and second opposed sides having therein first and second threaded holes, respectively;
c. a first clamp ring assembly attachable to said first mounting block for rigidly engaging the body of the telescope and removably engaging said first mounting block, said first ring assembly having a male dovetail stud rotatably engagable with said female dovetail recess of said first mounting block;
d. a second clamp ring assembly attachable to said second mounting block for rigidly engaging the body of the telescope, said second ring assembly including a lower pedestal having a flat bottom surface which is parallel to said flat top surface and substantially co-planar therewith when the male dovetail stud is engaged with the female dovetail recess;
e. first windage screw means disposed in the first threaded hole for retaining the first side of the pedestal, said first windage screw means having a first head which extends above the flat top surface to engage the first side of the pedestal; and
f. second windage screw means disposed in the second threaded hole for engaging the second side of said pedestal, said second windage screw means including a second head, the second head having a first flat surface, said second windage screw means being rotatable so that a first portion of the second head extends above the flat top surface and engages the second side of the pedestal, said second windage screw means being further rotatable so that said first flat surface is substantially parallel to the flat top surface and is at the same height as or lower than the flat top surface,
whereby the telescope and said first and second clamp ring assemblies can be mounted on the gun by turning said second windage screw emeans so that said first flat surface is parallel to the flat top surface and is at a height equal to or less than the height of the flat top surface, rotating the telescope so that the male dovetail stud engages the female dovetail recess, and sliding the flat bottom surface of the pedestal across the flat top surface of said first mounting block until the first side of the pedestal engages said first windage screw means, and tightening said second windage screw means, the first portion of said second head of said second windage screw means engaging the second side of the pedestal.

4,249,316
METHOD AND INSTALLATION FOR DRYING MOULDED PULVERULENT PRODUCTS
Louis G. Corse, Chaumont-sur-Tharonne, France, assignor to Machines Chambon, Orleans, France
Filed Nov. 29, 1978, Ser. No. 964,494
Claims priority, application France, Dec. 12, 1977, 77 37328
Int. Cl.[3] F26B *3/04, 15/10*
U.S. Cl. 34—28 **9 Claims**



1. A method for drying moulded pulverulent products, particularly humidified and agglomerated caster sugar by controlled evaporation, comprising:
displacing the products to be dried through a plurality of successive sections of an oven in which the temperature and relative humidity of the air is regulated;
sweeping the products to be dried by means of a main air stream flowing in the same direction as the direction of displacement of the products in a first part of the oven and in an opposite direction in a second part of the oven;
further sweeping the products to be dried in each section of said plurality of sections by an auxiliary air stream which is directed perpendicularly to the main air stream and the direction of the products in order to homogenize the atmosphere in each section of said plurality of sections;
humidifying the auxiliary air in all but the last two sections of said plurality of sections for slow drying by controlled evaporation;
adjusting the rate of flow of the humidified auxiliary air stream in a penultimate section of said plurality of sections to a relatively low value; and,
adjusting the rate of flow of the auxiliary air in an ultimate section after it leaves said penultimate section to a relatively high value without humidifying thereof.

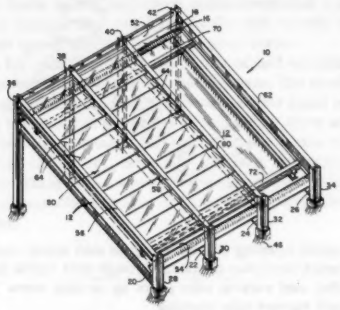
4,249,317
SOLAR DRYING APPARATUS AND PROCESS FOR DRYING MATERIALS THEREWITH
James D. Murdock, Ten Manchester Rd., Moylan, Pa. 19065
Filed Nov. 5, 1979, Ser. No. 91,049
Int. Cl.[3] F26B *3/28*
U.S. Cl. 34—93 **25 Claims**

1. A solar drying apparatus for drying granular materials,

sludge, or the like utilizing the sun's rays and convection air currents comprising:

(a) bed means having an upper and a lower edge disposed at an angle from the horizontal for retaining a layer of said material to be dried;

(b) cover means disposed a predetermined amount above



said bed means to provide a free flow of said air currents therebetween, said cover means being transparent to said sun's rays; and

(c) means disposed between said cover means and said bed means for piercing the upper portion of said material layer and causing said portion of materials to move slowly down the incline of said bed means.

4,249,318

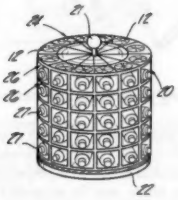
BASIC COLOR MEDIA SET FOR PROVIDING TONALLY MATCHED PALETTES

Martin C. Anderson, 2265 N. Oxford Rd., Oxford, Mich. 48051, and David T. Lonier, 1312 N. Woodward, Bloomfield Hills, Mich. 48013

Continuation of Ser. No. 792,149, Apr. 29, 1977, abandoned. This application May 29, 1979, Ser. No. 43,279

Int. Cl.³ B44D *3/00*

U.S. Cl. 434—103 **24 Claims**



1. A basic coloring material set for preparing tonally related source groupings of said coloring material comprising:

a quantity of each of three different colors of coloring materials comprising a primary set of colors;

a quantity of each of secondary coloring materials, each colored to correspond to each of said three different primary colors toned toward each of the other of said primary colors;

a quantity of each of a plurality of tertiary coloring materials, each colored in correspondence with the combination of all of said primary colors with each toned toward a respective one of said primary colors;

visual identification means associating each of said quantities of coloring materials in tonally related groupings of said coloring materials, said visual identification means including means ordering said quantities of coloring materials in a sequenced array, said array consisting of adjacent ordered subgroupings, each subgroup consisting of one each of said quantities of coloring materials of said three different primary colors, and two each of quantities of coloring materials of said secondary colors located on either side of each of said primary colors, each of said quantities of secondary coloring materials consisting of those secondary colors containing each of the other two primary colors toned by said one primary color in said subgroup; and, each of said subgroupings arranged with a quantity of coloring material of a tertiary color interposed between adjacent subgroups, each quantity of tertiary coloring material on either side of each subgroup consisting of said tertiary colors which are toned toward the other two of said primary colors not contained in the colors given in the subgroup disposed between said tertiary coloring materials;

whereby groupings of successive threes of said coloring materials in said sequenced array each consist of tonally related palettes, in that each of said coloring materials are consistently tonally influenced by a single color of a spectral range of colors.

4,249,319

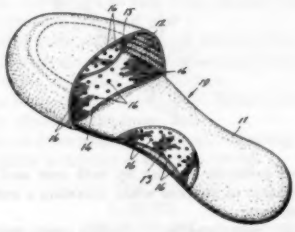
HEAT INSULATING INSERT FOR FOOTWEAR

Yoshiyasu Yoshida, 2-4-17 Kita Shinjuku, Shinjuku-Ku, Tokyo, Japan

Filed Jan. 18, 1980, Ser. No. 113,381

Int. Cl.³ A43B *7/02, 3/10*

U.S. Cl. 36—2.6 **8 Claims**



1. A heat insulating insert for a footwear comprising a main body which includes a base sheet having a shape substantially conforming with the shape of the sole of a human foot and a toe cover at the toe-shaped end of said base sheet corresponding to the toe of said human foot; and permeable bags positioned in said toe portion and a portion of said base sheet corresponding to the plantar arch of said human foot and on the inner surface of said toe cover and each containing exothermic agent which performs exothermic reaction with the open air upon contacting the open air, said permeable bags at said toe shaped-end of the base sheet and on the inner surface of said toe cover being in opposing and spaced relationship to each other to embrace said toe of the human foot.

4,249,320

MACHINE FOR STIFFENING AND FORMING SHEET MATERIAL

John G. Hollick, Beverly, Mass., assignor to USM Corporation, Farmington, Conn.

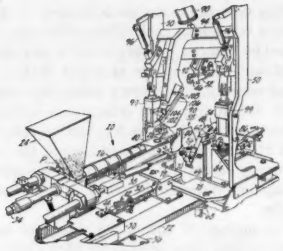
Division of Ser. No. 921,944, Jul. 5, 1978, which is a continuation-in-part of Ser. No. 806,559, Jun. 14, 1977. This application Jul. 30, 1979, Ser. No. 62,070

Int. Cl.³ A43B *13/42;* **A43D** *0/00*

U.S. Cl. 36—68 **4 Claims**

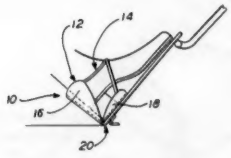
1. a new article of commerce comprising a shoe counter having bottom and top margins and a backseam centrally

disposed and extending between the margins, and a plurality of elongated resin deposits extending generally parallel to the



backseam on one side of the counter, said deposits symmetrically terminating short of the top edge.

4,249,321
HEEL PROTECTOR
Mary J. Nagy, 9 Curtis St., Bloomfield, N.J. 07003
Filed Sep. 7, 1979, Ser. No. 73,337
Int. Cl.³ A43B *13/22*
U.S. Cl. 36—72 B **14 Claims**



1. A heel protector for use by both men and women to prevent abrasion of the heel while operating a motor vehicle which comprises:

a generally hourglass-shaped, flexible cover means adapted to shroud the back and bottom surfaces of said heel, said cover means including two leaf members, each leaf member having a wide end, a narrow end and tapering peripheral margins extending therebetween, said leaf members joined to each other at said narrow ends,

a pocket defined by said narrow ends to cradle the rearmost leading edge of said heel, and

elastic means adapted to extend around the instep of the wearer to hold said heel protector in position comprising a generally X-shaped web member connecting the peripheral margins of said leaf members,

wherein said web member draws said leaf members toward each other and into snug contact with the back and bottom surfaces of said heel when said heel protector is placed over the heel and instep of the wearer.

4,249,322
SNOWPLOW
Charles S. McLaughlin, deceased, late of Harwichport, Mass., and Charles S. McLaughlin, Jr., executor, Three Fiddlers Landing, Harwichport, Mass. 02646
Filed Jun. 21, 1979, Ser. No. 50,666
Int. Cl.³ E01H *5/00*
U.S. Cl. 37—41 **2 Claims**

1. A vehicle-mounted snowplow comprising:

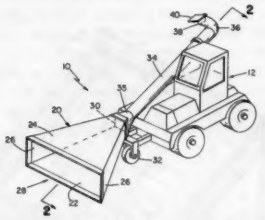
a scoop,

said scoop defining an intake opening at one end and being tapered so as to define a smaller throat opening at the other end,

an outlet means connected to said throat opening, and

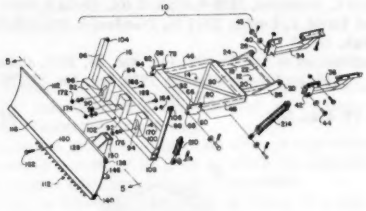
a suction tube connected to said outlet means,

said suction tube defining a suction tube opening at its end opposite said outlet means, whereby air ingested by said



intake opening of said scoop as said scoop moves forward, increases in speed through said outlet means so that said suction tube picks up surface snow through said suction tube opening.

4,249,323
VARIABLE WING PLOW BLADE AND MOUNTING STRUCTURE THEREFOR
Robert D. Mathis, Salt Lake City, and Gordon Hine, Logan, both of Utah, assignors to De Lorean Manufacturing Company, Bloomfield Hills, Mich.
Filed Jun. 19, 1978, Ser. No. 916,613
Int. Cl.³ D06F *71/00*; E02F *3/76*
U.S. Cl. 37—42 R **21 Claims**



1. A variable wing plow blade and mounting structure therefor comprising,

a variable wing plow blade having a center blade and a pair of wing blades each of which is connected at one end by a generally vertical hinge to a respectively associated end of said center blade and is provided with a rearwardly extending first pivot arm from an intermediate position thereof, said center blade including a separate rearwardly extending second pivot arm adjacent each end thereof,

first and second motor means connected respectively between each of said first pivot arms and associated one of said second pivot arms for effecting relative angular adjustment of each of said wing blades with respect to said center blade both forwardly and rearwardly with respect to a position of alignment therewith,

first frame means having a forward and and rearward end and adapted for attachment at the rearward end to a vehicle,

second frame means adjacent the forward end of said first frame means and generally vertically disposed with respect to said first frame means,

first connecting means including at least one upper and at least one lower pivot connection position for connecting the forward end of said first frame means to the lower end of said second frame means, said first connecting means

pivotally connecting the forward end of said first frame means to the lower end of said second frame means about an axis that is generally horizontal and parallel to the planes of said second frame means and center blade, said first connecting means including a pair of first pivot mounts, one being provided at each forward side of said first frame means, and clevis means associated with said pivot mounts and provided on the side of said second frame means remote from said center blade,

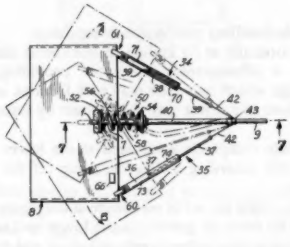
means for attaching said center blade of said variable wing plow blade to said second frame means, the attachment being such as to restrain relative movement about any axis that is parallel to the planes of said center blade and said second frame means, and said attaching means includes second connecting means for pivotally connecting said center blade to said second frame means about an axis that is substantially normal to the axis of said first connecting means.

4,249,324

STEERABLE OCEAN FLOOR DREDGE VEHICLE

John P. Latimer, Newport News, Va., assignor to Deepsea Ventures, Inc., Gloucester Point, Va.

Continuation-in-part of Ser. No. 910,080, May 26, 1978, Pat. No. 4,208,813. This application Apr. 25, 1979, Ser. No. 33,333
The portion of the term of this patent subsequent to Feb. 24, 1997, has been disclaimed.
Int. Cl.³ E02F *3/88*
U.S. Cl. 37—58 **10 Claims**



1. A dredging system designed and adapted to be towed along the ocean floor via a surface vessel connected thereto by a tow line, the dredge system comprising:

(a) a dredge vehicle;

(b) lower tow connector means secured to the dredge vehicle;

(c) positioning means for pivotally and telescopically securing the lower tow connector to the tow line including a tow-line coupling;

(d) a first and a second hydraulically actuated, telescopically movable steering linkage means extending between the tow-line coupling and opposing first and second sides of the dredge vehicle; and

(e) means for alternately hydraulically activating the first and second steering linkages,

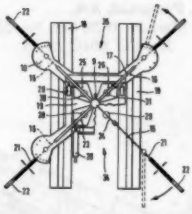
whereby the dredge vehicle can be pivoted relative to the tow line by hydraulically pushing on the first steering linkage, so as to shorten the first linkage and thus pulling the first side of the dredge vehicle towards the coupling and can be pivoted in an opposite direction relative to the tow line by hydraulically pushing on the second steering linkage so as to shorten the second linkage and thus pulling the second side of the dredge vehicle towards the coupling.

4,249,325

TRACK WORKING MACHINE FOR DISTRIBUTING AND SHAPING THE BALLAST OF A RAILROAD BED

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Nov. 13, 1979, Ser. No. 93,048
Claims priority, application Austria, Feb. 2, 1979, 806/79
Int. Cl.³ E01B *27/04*
U.S. Cl. 37—104 **11 Claims**



1. A track working machine for distributing and shaping the ballast of a railroad bed whereon two track rails are supported, the track rails defining a transversely extending space therebetween, which comprises

(a) a frame,

(b) a ballast plow arrangement vertically adjustably mounted on the frame, the plow arrangement including a generally V-shaped plow including

(1) a pair of plow blades, a respective one of the plow blades associated with each track rail and bridging over the associated track rail, and

(2) a ballast guide plate associated with each plow blade in the transversely extending space and adjustable in relation to the associated plow blade,

(c) a drive for vertically adjusting the ballast plow arrangement in relation to the frame, and

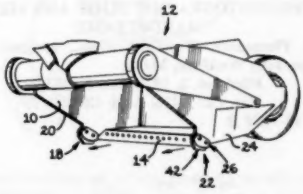
(d) additional drive means for vertically adjusting the ballast guide plates in relation to the plow blades.

4,249,326

ROUTER BIT

Russell D. Merkel, Coal City, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US79/00133, § 371 Date Mar. 5, 1979, § 102(e) Date Mar. 5, 1979, PCT Pub. No. WO80/01926, PCT Pub. Date Sep. 18, 1980
This PCT application filed Mar. 5, 1979, Ser. No. 38,983
Int. Cl.³ E02F *9/28*
U.S. Cl. 37—141 T **9 Claims**



1. A router bit assembly (**18,22**) adapted to be mounted on an earthmoving machine (**12**) having a side wall (**24**) with a leading edge (**58**) comprising:

a router bit (**42**) having a rear edge (**56**);

a holder (**26**) for said router bit (**42**), said holder including a pair of side walls (**28,30**), a pair of spacer portions (**34,36**) on said holder for holding the side walls spaced apart and for defining a slot (**32**) therebetween, said router bit being seated in and retained by said slot (**32**) with said rear edge

in abutting relationship with said leading edge (58) of said side wall (24) of said machine; and

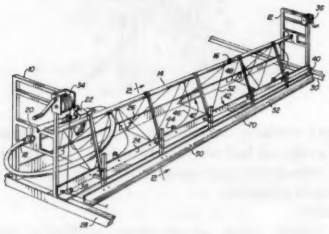
means (66,68) for fastening the walls (28,30) of said holder (26) to opposite sides of said side wall (24) of said machine (12).

4,249,327

FINE GRADER

J. Dewayne Allen, Paragould, Ark., assignor to Allen Engineering Corporation, Paragould, Ark.

Filed Mar. 26, 1979, Ser. No. 23,904
Int. Cl.[3] E01C *19/38*
U.S. Cl. 404—114 14 Claims



1. In a screed for leveling freshly poured concrete lying in an area between opposing side forms to produce a smooth, finished concrete surface, the screed comprising:

a. a frame having a screed blade;

b. means coupled to the frame for translating the screed along the side forms; and

c. means coupled to the frame for imparting vibratory motion to the screed blade;

Wherein the improvement comprises:

a fine grader attachment for the screed for fine grading the surface of the subgrade on which fresh concrete is to be poured to form a predetermined surface contour for receiving the freshly poured concrete, said fine grader attachment including:

(a) a fine grader blade;

(b) bracket means coupled to the frame and to the screed blade for maintaining said fine grader blade in a grading position below and in front of the screed blade; and

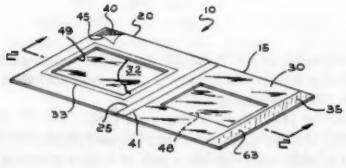
(c) means rigidly coupled to said bracket means and loosely contacting the screed blade for transmitting the vibrations of the screed blade through said bracket means to said fine grader blade.

4,249,328

ELECTROPHOTOGRAPHIC SLIDE AND METHOD OF MAKING SAME

John D. Plumadore, Westfield, Mass., assignor to Photon Chroma, Inc., Westfield, Mass.

Filed Jul. 2, 1979, Ser. No. 53,901
Int. Cl.[3] A47G *1/06;* G09F *1/10*
U.S. Cl. 40—158 B 10 Claims



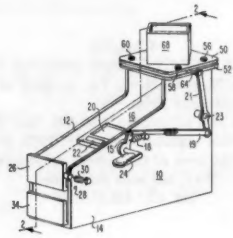
1. Slide transparency for electrophotographic film which includes an electrically conductive layer comprising a generally planar frame including a pair of panels defined by a hinge therebetween and each lying in generally in the same plane before folding and each having a window shaped projection aperture therethrough registrable when the panels are folded together about said hinge, the first of said panels having an electrophotographic film disposed thereon spanning the window aperture therein, the inner surface of the second panel having an adhesive thereon for bonding the two panels together in superposed relation when folded about said hinge, and an electrically conductive strip disposed on said film for grounding said electrically conductive layer of the film when imaging said film before said frame is folded.

4,249,329

APPARATUS FOR VIEWING AND SORTING PHOTOGRAPHIC SLIDE TRANSPARENCIES

Owen L. Lamb, 662 W. Sunnyoaks Ave., Campbell, Calif. 95008

Filed Sep. 28, 1979, Ser. No. 79,797
Int. Cl.[3] G02B *27/02*
U.S. Cl. 40—361 27 Claims



1. A slide-handling mechanism comprising:

a chute oriented at an incline to horizontal adapted to receive a photographic slide, for providing a passage through which said slide may pass from an upper end of the chute to a lower end of the chute by force of gravity; and

a first slide receptacle positioned at the lower end of said chute for receiving a slide dropping off the end of said chute;

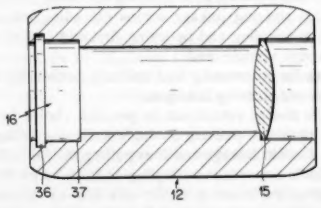
whereby a slide placed in said chute at the upper end thereof drops by force of gravity to the lower end of said chute where said slide is free to exit said chute and drop into said receptacle.

4,249,330

MEDICAL PENDANT

Joseph J. Chioffe, 811 Beckman Dr., N. Bellmore, N.Y. 11710

Continuation-in-part of Ser. No. 901,444, May 1, 1978, abandoned. This application Dec. 26, 1979, Ser. No. 107,269
Int. Cl.[3] G02B *27/02*
U.S. Cl. 40—363 2 Claims



1. An article of jewelry comprising a pendant in the form of an elongated capsule, and capsule having a cavity longitudi-

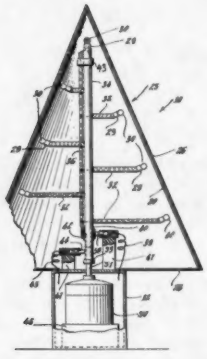
nally throughout the interior thereof, a magnifying lens fixedly mounted vertically within said capsule near one end thereof and recessed from said end, a film module having a ridge extending exteriorly around the circumference thereof, said module being hollow with one end closed by a light distributing translucent material, a groove extending interiorly around the circumference thereof, a film containing terms for identification and medical history of the person to be wearing said article, said film being retained in said groove within said module, said cavity within said capsule having an annular groove adjacent the open end thereof and having an inner diameter equal to the outer diameter of said annular ridge, whereby said module may be snapped into place within said capsule and said film will be precisely at the focal point of said lens, said capsule being air and moisture tight between said lens and said film when said module is within said capsule.

4,249,331

DYNAMIC STAR BURST DISPLAY

John B. Vernon, 36 Meyer Pl., Riverside, Conn. 06878

Filed Mar. 5, 1979, Ser. No. 17,393
Int. Cl.³ G09F *13/30*
U.S. Cl. 40—432 **25 Claims**



1. A dynamic display of attractive patterns of moving light images comprising:

(a) a plurality of light sources,

(b) an enclosure having a viewable translucent layer,

(c) mounting means for positioning said plurality of light sources in spaced relation within said enclosure,

(d) drive means for providing relative movement between said plurality of light sources and said viewable translucent layer for moving the respective light sources closer to and farther away from said viewable layer,

(e) means for supplying electric power to said plurality of light sources for energizing said light sources,

(f) said viewable translucent layer being made of intrinsically transparent material having an outer surface containing a myriad of outwardly-projecting tiny pyramidal-shaped prisms positioned adjacent to each other,

(g) said pyramidal-shaped prisms being so tiny and so numerous that they cause said layer of intrinsically transparent material to appear translucent as viewed from the outside,

(h) said tiny pyramidal-shaped prisms causing each of said light sources to be seen in a pattern of light images as viewed by looking at the outside of said viewable layer, and

(i) said light patterns varying in size and spacing as the effective distances between said light sources and said viewable layer increases and decreases due to the relative movement between said light sources and said viewable layer.

4,249,332

GUN SIGHT

Gim S. Ng, Newport News, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 7, 1979, Ser. No. 9,999
Int. Cl.³ F41G *1/10*
U.S. Cl. 42—1 S **4 Claims**

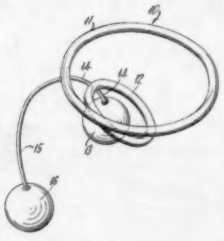
1. In a rear sight for firearms, the combination of a resilient sight leaf and means biasing the sight leaf vertically for elevation adjustment, with a double sight element attached to the sight leaf and adjustment means for sliding the double sight element laterally for windage adjustment, the double sight element including two sight plates disposed one behind the other in the line of sight forming a front plate and a rear plate, the front plate relative to the line of sight having a smaller notch than the rear plate, the front plate, again relative to the line of sight, having different reflective properties from the rear plate, the notch size and reflective property differences resulting in a silhouetted sighting groove.

4,249,333

INFANT DEVELOPMENT RING TOY

Richard A. Chase, Baltimore, Md.; D. Michael Williams, Morin Heights, Canada, and Danny E. Simpson, Baltimore, Md., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Mar. 8, 1978, Ser. No. 884,780
Int. Cl.³ A63H *33/00*
U.S. Cl. 46—1 R **5 Claims**

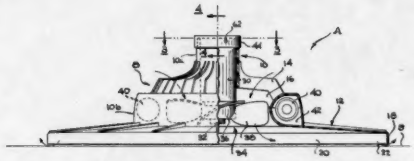


1. An infant development toy comprising: a plurality of rings of varying diameter, including a largest ring, a next largest ring, a central object, and flexible connecting means connecting said central object and said plurality of rings in such a manner, that when the toy is freely suspended from the point of connection of the largest ring and the connecting means, the connecting means is disposed vertically as the toy assumes a configuration wherein the rings are concentric about the central object, said flexible connecting means being the sole means connecting said rings, and said connecting means being sufficiently flexible that the next largest ring is readily movable out of the plane defined by the largest ring.

4,249,334
TOY HOVERCRAFT APPARATUS

Adolph E. Goldfarb, Tarzana, and Delmar K. Everitt, Woodland Hills, both of Calif., assignors to Adolph E. Goldfarb, Tarzana, Calif.

Filed Feb. 12, 1979, Ser. No. 11,443
Int. Cl.[3] A63H *27/12, 27/14*
U.S. Cl. 46—1 J 26 Claims



1. A toy hovercraft apparatus comprising:

(a) a toy hovercraft adapted to be supported on a self-generated air cushion for generally horizontal movement over a floor or other surface, said toy hovercraft comprising:

(1) a frame,

(2) means on the frame defining a downwardly open air chamber, said chamber defining means having top wall means and peripheral side wall means extending generally downwardly from said top wall means, and

(3) means mounted on said frame and in communication with said air chamber to introduce air into said chamber, and

(b) a launcher for said hovercraft comprising:

(1) a base,

(2) means on said base for generally maintaining said hovercraft in a ready position prior to launching,

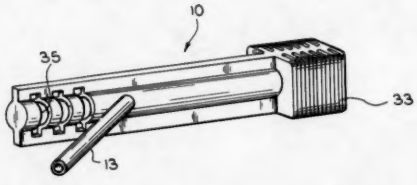
(3) launching means associated with said base capable of imparting force to said hovercraft to cause it to move in a generally horizontal direction, and

(4) control means for selectively causing said launching means to impart said movement to said hovercraft.

4,249,335
BUBBLE-BLOWING DEVICE

Joseph J. Castanino, 34 Lori La., East Bridgewater, Mass. 02333

Filed Nov. 14, 1977, Ser. No. 851,486
Int. Cl.[3] A63H *33/28*
U.S. Cl. 46—6 2 Claims

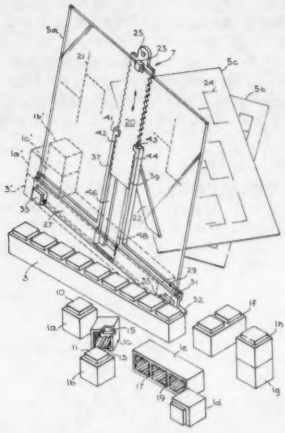


1. A bubble-blowing device comprising an elongated hollow body comprising a lateral wall and open at both ends, one end being adapted to be dipped into a bubble-blowing liquid to form a film thereof spanning the front end and a mouthpiece intersecting the lateral wall of the body at an acute angle, the vertex of the angle being toward the front end to supply air to the interior of the body, whereby the volume of air passing from the mouthpiece into the interior of the body flows principally to the front of the body to impinge on said film to form a bubble at said front end.

4,249,336
CONSTRUCTION TOY

Walter Moe, 13039 Sky Valley Rd., Los Angeles, Calif. 90049; Charles M. Diker, 944 Fifth Ave., New York, N.Y. 10021, and Lawrence A. Bernstein, P.O. Box 4096 (Malibu), Los Angeles, Calif. 90265

Filed Mar. 3, 1980, Ser. No. 126,954
Int. Cl.[3] A63H *33/04*
U.S. Cl. 46—17 11 Claims



1. A construction toy which includes:

(a) a plurality of interconnectable blocks for coupling with one another to form an easily assemblable and disassemblable stacked structure;

(b) a planar sheet containing a printed pattern, said pattern defining a structure assemblable for said blocks;

(c) an elongate grid block having means on its top interlockable with the blocks of said plurality;

(d) support fixture means for holding said planar sheet and said elongate grid block in a relationship with a side wall of said grid block extending along and in part overlying a bottom portion of the pattern-carrying surface of said planar sheet;

(d1) an elongate horizontally extending base section containing two longitudinally extending surfaces recessed from one another and a narrow ledge therebetween;

(d2) retainer means for holding said grid block upon said base in a position in which said grid block overlies said ledge to define between said block, ledge and one of said recessed walls, a slot for receiving one edge of said planar sheet;

(d3) second retainer means located spaced from said first retainer means and said formed slot for holding an opposed edge of said planar sheet;

whereby a structure defined by said printed pattern may be assembled from said building blocks on top of said grid block and in overlying relation to said pattern.

4,249,337
BREAST FEEDING DOLL SET

Theresa M. Edson, 7345 Sichting Rd., Martinsville, Ind. 46151

Filed Jul. 17, 1979, Ser. No. 58,398
Int. Cl.[3] A63H *3/00*
U.S. Cl. 46—153 6 Claims

1. A breast feeding doll set comprising a mother doll having simulated breasts, first fastening means secured to the tip of each breast, a baby doll having a head and second fastening means secured to the head at the location of the mouth, said first and second fastening means being complimentary to each

other for securing the baby doll to the mother doll in a simulated breast feeding operation and means for maintaining the

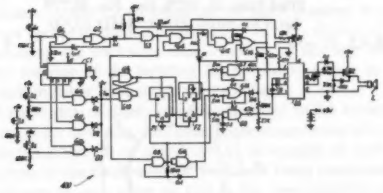
arms of the mother doll in holding relation with respect to the baby doll.

4,249,338

DOLL WITH SOUND GENERATOR AND PLURAL SWITCH MEANS

Howard Wexler, 300 E. 40th St., New York, N.Y. 10016

Filed Nov. 26, 1979, Ser. No. 97,158
Int. Cl.³ A63H *33/26*
U.S. Cl. 46—232 **15 Claims**



1. A doll comprising a doll body,

(a) an electrical sound generator within the doll body,

first switch means within the doll body for actuating the sound generator,

at least two additional switch means within the doll body, each of the additional switch means being individually couplable to the sound generator for actuation to deactivate the sound generator, and

automatic selection means within the doll body for randomly determining which of the additional switch means is coupled to the sound generator for deactivating the sound generator.

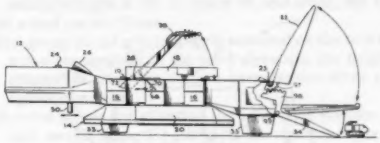
4,249,339

SPACE TOY

Philip W. Crain, San Pedro; William J. Kelley, and Daniel J. Shoff, both of Torrance, Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Feb. 16, 1979, Ser. No. 12,922
Int. Cl.³ A63H *33/26*
U.S. Cl. 46—232 **6 Claims**

1. A toy having a main body; a door affixed to the main body; means for mechanically opening the door including a rod, a spring wound about the rod, means for affixing one end of the spring to the rod, means for urging the spring along the axis of the rod, means for slowing the movement of the rod along its axis, and means attached to the rod for moving the



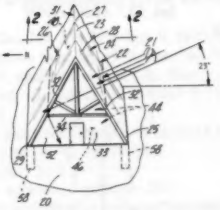
door; and means for simulating the sound of a door moving while the door is opening.

4,249,340

SOLAR ENERGY COLLECTOR

Reed A. Maes, Jr., Ypsilanti, Mich., assignor to Environmental Research Institute of Michigan, Ann Arbor, Mich.

Filed Dec. 7, 1978, Ser. No. 967,470
Int. Cl.³ A01G *9/00*
U.S. Cl. 47—17 **13 Claims**



1. A solar energy collection device comprising:

a walled structure having a plurality of walls with upper and lower portions defining a first lower space volume and a second upper space volume, at least the lower portions of the walls being insulated, one of said walls being light transmitting for substantially its entire height and having its lower portion insulated with light transmitting material;

an insulated panel in the upper space volume and having a reflective major surface;

means for generally horizontally supporting the panel in a first position to enclose the lower space volume in cooperation with the insulated lower portions of the walls to prevent heat loss therefrom; and

means for pivoting said panel into an inclined second position with said reflective surface of the panel facing the lower space volume for diverting substantial amounts of the solar radiation passing through the upper portion of said light transmitting wall directly into the lower space volume to thereby increase the amount of solar radiation therein.

4,249,341

PACKAGE FOR SPROUTS

Ronald W. Huegli, Beaverton, Oreg.

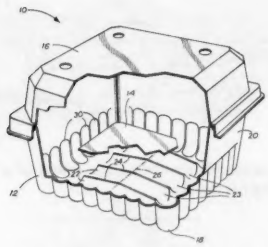
Filed Aug. 27, 1979, Ser. No. 70,152
Int. Cl.³ A01C *1/00*
U.S. Cl. 47—14 **8 Claims**

1. In a container for sprouting seeds which require watering during sprouting

a generally planar seed tray,

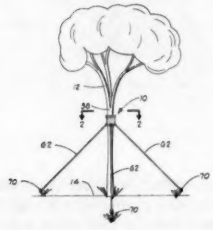
fulcrum means supporting said tray at a supported region therein for limited free angulation to different inclined

dispositions wherein edges in the tray have elevations differing from the elevation of said supported region, and



port means adjacent said edges for draining liquid from said tray.

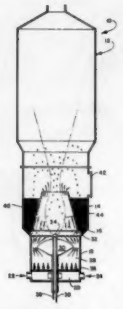
4,249,342
PLANT SUPPORT
Wilburn R. Williams, Rte. 2, Atoka, Okla. 74525
Filed Jul. 11, 1979, Ser. No. 56,537
Int. Cl.³ A01G *17/04*
U.S. Cl. 47—43 **10 Claims**



1. A plant support apparatus, comprising:
a first collar portion having a semi-cylindrical middle portion with a flange portion at an end of said middle portion;
a second collar portion having a semi-cylindrical middle portion with a flange portion at an end of said middle portion;
holding means for holding said first and second collar portions together so that said semi-cylindrical middle portions thereof form a cylindrical collar means for surrounding a stem of a plant, said flange portions of said first and second collar portions forming a flange extending radially outwardly from said cylindrical collar means in a plane normal to a longitudinal axis of said cylindrical collar, said flange including attachment means for attaching collar, said flange including attachment means for attaching a plurality of guidelines thereto; and
a plurality of guidelines connected between said attachment means and a ground surface to support said plant.

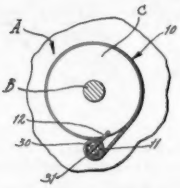
4,249,343
SEED COATINGS
Clarence C. Dannelly, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Jul. 25, 1979, Ser. No. 60,547
Int. Cl.³ A01C *1/06*
U.S. Cl. 47—57.6 **13 Claims**

1. A plant seed having a substantially continuous coating on the surface thereof, said coating comprising polymeric microgel particles, the binding forces at the interface between particles of the coating having a greater sensitivity to water than the binding forces which maintain the particles intact, whereby contact with water destroys the continuity of the coating by



releasing the binding forces between adjacent microgel particles.

4,249,344
TREE BALL GRABBER
Lindsay L. Pratt, Cherry Hill, N.J., assignor to Grabber, Inc., Cherry Hill, N.J.
Filed May 21, 1979, Ser. No. 40,779
Int. Cl.³ A01G *23/04*; B65D *63/00*
U.S. Cl. 47—76 **4 Claims**

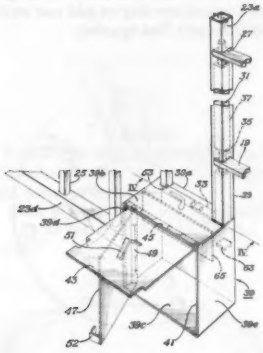


1. A transplanting device for preserving the integrity of the earth embedded root system of a plant or shrub in a ball of earth, said device comprising:
(a) a strip of flexible material having two ends and a length sufficient to wrap around an earth ball embedding the root system of a plant or shrub, said strip forming a belt surrounding and conforming to the earth embedded root system;
(b) a winding mandrel presenting a surface to said strip which is longer than the strip is wide, said winding mandrel having a means for engaging at least one end of said flexible strip and positioning the other end of said strip for frictional engagement in lapped relation between a portion of said strip adjacent said one end and said mandrel to bind said other end in position under said strip and against said mandrel; and
(c) means engaging said mandrel for turning said mandrel in a direction such that it wraps into said strip and draws said strip about the earth ball to preserve the integrity of the earth ball, said turning means having a portion thereof in position to be inserted between said strip and the earth ball, thereby locking said mandrel turning means to said strip for retaining said strip in wrapped position.

4,249,345
RELEASABLE WINDOW GUARD

Ricky V. Littleton, 1401 N. Rogers, Irving, Tex. 75061

Filed Aug. 27, 1979, Ser. No. 69,634
Int. Cl.[3] E06B *3/68*
U.S. Cl. 49—56 11 Claims



1. An improved window guard assembly of the type having a guard for covering a building window, attachment means for pivotally mounting the guard to a window frame to allow opening and closing movement, and locking means for selectively preventing opening movement, the locking means including a manually actuable latch member for controlling the locking means, the improvement comprising:

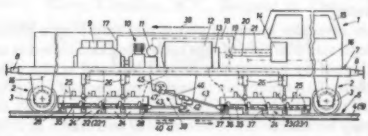
enclosure means for surrounding the latch member to prevent access to the latch member from the exterior of the building, the enclosure means having an opening facing the interior of the building for providing access to the latch member from inside the building;

and a plurality of doors hingedly mounted to the enclosure means for covering the opening, the doors being of a size that requires all of the doors to be opened to provide access to the latch member, the doors being positioned in relation to each other so that in the open position, they define a barrier that requires one on the exterior of the building to reach around the doors in an attempt to reach the latch member.

4,249,346
MOBILE RAIL GRINDING MACHINE AND METHOD

Josef Theurer, and Klaus Riessberger, both of Vienna, Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Feb. 21, 1978, Ser. No. 879,956
Claims priority, application Austria, Feb. 21, 1977, 115077; Sep. 7, 1977, 6443/77
Int. Cl.[3] B24B *23/00*
U.S. Cl. 51—178 33 Claims



1. A mobile rail grinding machine for continuously grinding irregularities off surface areas of track rails while the machine advances continuously along the track, which comprises

(a) a machine frame,

(b) undercarriages mounting the machine frame on the track rails,

(c) means for continuously moving the machine frame on the undercarriages in the direction of, and along, the track,

(d) a tool carrier frame,

(e) a group of rail grinding tools mounted on the tool carrier frame successively in the track direction, the tools being adapted to grind the surface irregularities when pressed against the rails,

(f) drive means for adjusting the transverse position of the tool carrier frame in relation to the machine frame,

(g) suspension means for vertically adjustably mounting the tool carrier frame on the machine frame for swinging movement in the track direction and for pressing the tools against the surface areas of the rails to be ground, and

(h) a drive connected to the tool carrier frame and operating independently of the means for continuously moving the machine frame for imparting to the tool carrier frame a reciprocatory working movement in the track direction additional to the movement simultaneously imparted to it by the continuous movement of the machine frame.

4,249,347
DIAMOND PASTE

Svetlana T. Bura, ulitsa Dorogozhitskaya, 26, kv. 31, and Jury I. Nikitin, ulitsa Krasnopolskaya, 11/13, kv. 41, both of Kiev, U.S.S.R.

Continuation of Ser. No. 539,807, Jan. 9, 1975, abandoned. This application Sep. 18, 1979, Ser. No. 76,597
Claims priority, application U.S.S.R., Mar. 11, 1974, 2003239
Int. Cl.[3] B24B *1/00*; C08J *5/14*
U.S. Cl. 51—298 4 Claims

1. A diamond paste for treating surfaces of workpieces consisting essentially of (in % by weight):

diamond powder: 30-2

surface-active substance-stearine: 20-5

low-molecular weight heat-resistant synthetic rubber: 20-40

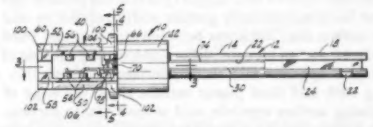
lubricating cooling substance-castor oil: 15-5

vaseline: 15-5

4,249,348
ADAPTER FOR HONING MANDRELS

Harold T. Rutter, St. Louis, Mo., assignor to Sunnen Products Company, St. Louis, Mo.

Filed Jul. 2, 1979, Ser. No. 53,844
Int. Cl.[3] B24B *33/02*
U.S. Cl. 51—338 10 Claims



1. An adapter for operatively supporting a honing mandrel on a honing machine during a honing operation, the honing mandrel including an elongated member having a groove formed extending along one side thereof and means at one end of the groove for supporting an abrasive work engaging assembly, means formed on one end of the mandrel for mounting the mandrel in the adapter, a wedge member positioned in the mandrel groove and extendable into the adapter, said wedge member having a tapered surface engageable with the abrasive assembly and being axially movable in the mandrel groove to radially reposition the abrasive work engaging assembly therein, the adapter comprising a first portion for receiving said one end of the mandrel and a second substantially U-shaped portion connected to the first portion and including a pair of spaced opposed side walls and a wall portion connected therebetween, means adjacent one end of one of said opposed side walls forming a groove therein opposite the open side of

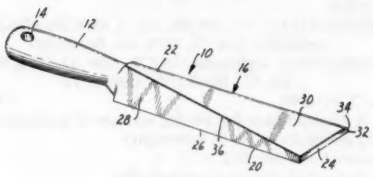
said second U-shaped portion, an elongated spring member of formed material having a substantially U-shaped portion at one end, said U-shaped spring portion being anchored in said adapter groove, and an opposite spring end portion located radially outward from the U-shaped spring end portion adjacent to the open side of the U-shaped second adapter portion, an elongated member extending along the mandrel groove and having one end portion thereof located in the adapter, said one end portion of the elongated member engaging the opposite spring end portion whereby said elongated member is biased by said spring member into engagement with the abrasive work engaging assembly, other means on one of said adapter side walls engageable by the wedge member to prevent radial movements thereof relative to the adapter, and means for adjusting the position of said other means on one of said side walls to accommodate wedge members in different predetermined positions in the adapter.

4,249,349

ELONGATE SANDING BLOCK

John T. Rueb, Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 6, 1978, Ser. No. 958,101
Int. Cl.³ B24P *15/00*
U.S. Cl. 51—392 **4 Claims**



1. A sanding block comprising a handle portion, and an elongate support portion projecting from the handle portion having a plurality of longitudinally extending smooth surfaces adapted to have pressure sensitive adhesive coated finishing material adhered thereto, said surfaces including a first rectangular planar surface, a second planar surface intersecting said first surface at an acute included angle, a third planar surface on the side of said support portion opposite said first planar surface, said first and third planar surfaces converging toward an end of said support portion opposite said handle portion and being so disposed that ordinates of said first and third planar surfaces transverse of said support portion are parallel and that said end has a substantially greater width parallel to said first planar surface than thickness between said first and third planar surfaces; and an arcuate surface intersecting the side of said first surface opposite said second surface and smoothly converging with said third planar surface along the edge of said third planar surface opposite said second planar surface, said arcuate surface having a smoothly decreasing radius about an axis extending generally longitudinally of said support portion away from said handle portion.

4,249,350

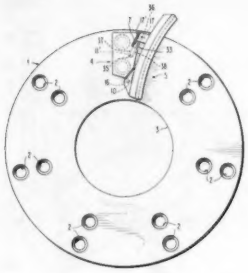
ABRASIVE THROWING WHEEL AND IMPROVED BLADE ASSEMBLY

James R. Goff, 6601 Shawnee Dr., Oklahoma City, Okla. 73116

Continuation of Ser. No. 850,763, Nov. 11, 1977, abandoned.
This application Jan. 15, 1979, Ser. No. 3,689
Int. Cl.³ B24C *5/06*
U.S. Cl. 51—434 **11 Claims**

1. In a rotatable centrifugal abrasive throwing device comprising a driven wheel; a plurality of circumferentially spaced blade blocks on said wheel; a plurality of radially extending blades, each of said blades secured to said wheel by one of said blade blocks, each of said blades having a front surface and a rear surface; a central opening in said driven wheel; a hollow, vaned, driven impeller mounted in said central opening rotatable with said wheel; a stationary control cage around said impeller, said control cage having an opening therein for the passage of abrasive material from said impeller onto said blades; and means for feeding particulate, abrasive material to said impeller; the improvement

wherein each of said blades has a first opening on said rear surface and a second opening on said rear surface opposite and spaced from said first opening;



each of said blade blocks has a rigid projecting means adapted for insertion in said first opening on the rear of said blade, an abutment means adapted to contact the rear of said blade, and an opening intermediate said projecting means and said abutment means; and

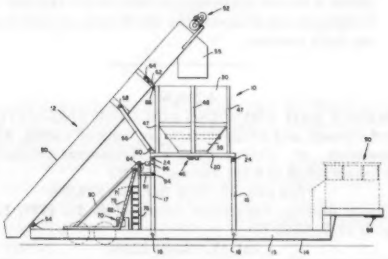
locking means of a deformable, resilient material for insertion in said second opening in the rear of said blade and for insertion in said opening in said blade block, to thereby lock said blade in position on said wheel.

4,249,351

SELF-ERECTING SURGE BIN

J. Donald Brock, Chattanooga, Tenn., assignor to Astec Industries, Inc., Chattanooga, Tenn.

Filed Jun. 5, 1978, Ser. No. 912,501
Int. Cl.³ E04H *7/22*; B65D *88/52*
U.S. Cl. 52—64 **2 Claims**



1. A collapsable storage apparatus comprising:

a frame;

a bin pivotally mounted above said frame on a plurality of legs, said plurality of legs each being connected at one end thereof by a pivot pin to said bin, and at the other end thereof by a pivot pin to said frame, each of said pivot pins being parallel to said other pivot pins, whereby said bin may be selectively lowered onto said frame at a location horizontally displaced from the position of said bin above said frame, said frame extending perpendicularly with respect to said pivot pins to receive said bin; and

means for lowering said bin and said legs onto said frame by pivotal motion of said bin and said legs with respect to one another and with respect to said frame; said legs being

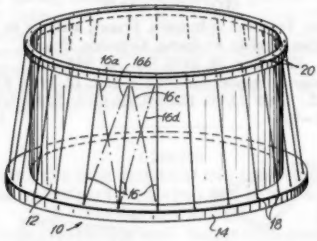
lowered to rest horizontally on said frame; said lowering means comprising means mounted on said frame for extending a cable attached to said bin to lower said bin onto said frame; and said cable extending means being in the same position with respect to said frame when said bin is above said frame and when said bin is lowered onto said frame.

4,249,352

EARTHQUAKE RESISTANT TANK

Tadeusz J. Marchaj, Pt. Washington, N.Y., assignor to Preload Technology, Inc., Garden City, N.Y.

Filed May 16, 1978, Ser. No. 906,332
Int. Cl.³ E02D *27/34*
U.S. Cl. 52—167 **9 Claims**



1. A stationary tank of improved structural integrity for the storage of liquids or solids adapted to withstand forces acting upon the side walls thereof under earthquake conditions, including a concrete base; a vertically-positioned cylindrical side wall; and a plurality of tendons each tendon being stressed and each tendon being affixed at one end to said cylindrical side wall and at the other end to an anchor fixedly positioned in said concrete base at a position radially displaced from said side wall, so that said tendons each slope generally radially and downwardly from said side wall to said anchor and the stress in each said tendon has a radial as well as a vertical component to restrain said side walls from horizontal displacement and to mitigate the vertical stresses caused by earthquake conditions.

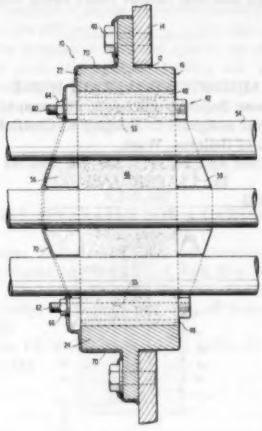
4,249,353

FIRE BARRIER ASSEMBLY FOR ELECTRICAL CABLE

Richard C. Berry, Camillus, N.Y., assignor to Crouse-Hinds Company, Syracuse, N.Y.

Filed Feb. 27, 1979, Ser. No. 15,842
Int. Cl.³ E04C *2/52*
U.S. Cl. 52—232 **7 Claims**

1. A barrier assembly comprising frame means having a substantially rectilinear opening extending therethrough and a plurality of plate assemblies removably disposed in said frame means parallel to each other; each plate assembly being comprised of a resilient plate, a compression plate on each end of said resilient plate, adjustable connecting means connecting said plates together for movement toward and away from each other, at least one pair of ribs disposed along opposed edges of said resilient plate between said compression plates and a plurality of spaced apart ribs disposed on opposed surfaces of said



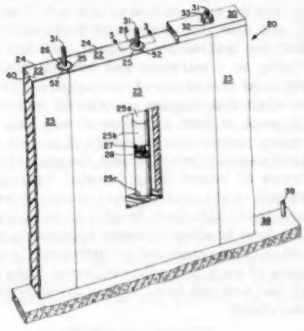
opening for the reception of the ribs on said plate assemblies therebetween.

4,249,354

REINFORCED INSULATED WALL CONSTRUCTION

Gayle B. Wynn, 56 Beech Dr., Edgewood, Ky. 41017

Filed Mar. 5, 1979, Ser. No. 17,392
Int. Cl.³ E04B *2/24*
U.S. Cl. 52—438 **1 Claim**



1. A reinforced insulated wall construction which is reinforced by high slenderness ratio reinforced concrete columns, said construction comprising

a first sheet and a second sheet of facing material disposed in spaced relation,

a core of thermal insulation material disposed intermediate said sheets, said core having a plurality of vertically extending, laterally spaced passageways provided therein, a tubular liner disposed in each said passageway, said liner having only about its central elevational one third length portion comprised of a relatively high flexural strength tubular form,

an elongate, high-slenderness-ratio reinforcing member disposed in each said tubular liner, said reinforcing member having a relatively small transverse cross section relative to said tubular liner,

means for axially positioning said member in said passageway throughout its length, said means for axially positioning said reinforcing member comprising a plurality of

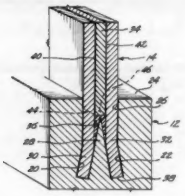
longitudinally spaced radially extending spacer elements, said reinforcing members and said spacer elements being encased by and said tubular liners being filled with concrete.

4,249,355

MODIFIED DOVETAIL JOINT

Earl R. Anderson, Bellevue, and Lee E. Johnson, Mercer Island, both of Wash., assignors to Douglas E. Chatfield and Frank Novak, both of Bellevue, Wash.

Filed Apr. 12, 1977, Ser. No. 786,761
Int. Cl.³ E04C *1/10, 3/30*
U.S. Cl. 52—593 **17 Claims**



1. A modified dovetail joint for interconnecting a plywood web to a chord in mutually intersecting relationship, said plywood web comprising at least first and second layers of veneer and at least one intervening layer of veneer, said web having an edge portion, said chord having a surface and at least first and second grooves extending inwardly into said chord, said first and second grooves being separated by a spacer member integral with said chord, the edge portion of said web having at least first and second tongues extending into mating engagement with respective ones of said first and second grooves, said first and second tongues being separated by a web groove extending into the edge portion of said web from the edge of said web, said web groove receiving said spacer member between said first and second tongues, said first and second grooves being so constructed and oriented relative to each other as to cause at least one of said tongues to flex relative to the other when said tongues are inserted into said first and second grooves, at least a portion of said first and second tongues being composed respectively of at least a portion of said first and second layers of veneer, the grain of said first and second layers of veneer being oriented transversely to the surface of said chord, said first and second layers of veneer being respectively adhesively bonded to an intervening layer of veneer to form an adhesive lamina between each of said first and second layers of veneer and an intervening layer of veneer, the terminus of each said adhesive lamina lying in the edge portion of said web and being located inwardly from the surface of said chord.

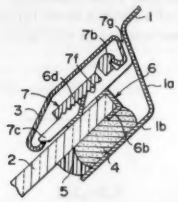
4,249,356

MOULDING CLIP DEVICES FOR ADHESIVELY ATTACHED WINDSHIELD STRUCTURES

Shizuma Noso, Tokyo, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Jul. 31, 1979, Ser. No. 62,466
Claims priority, application Japan, Jul. 31, 1978, 53-105870[U]
Int. Cl.³ E04B *1/62*
U.S. Cl. 52—717 **9 Claims**

1. In an automobile windshield structure comprising a windshield glass adhesively attached to a body frame at a windshield opening thereof, a clip device for installing a moulding along peripheral edge portion of the glass, said clip device comprises a first clip member having means for gripping the peripheral edge portion of the glass and guide channel means, and a second clip member having means for engaging the moulding and means for slidably engaging with said guide channel means in the first clip member, said first clip member being formed with resilient retaining means and said second clip member with indentation means engageable with said



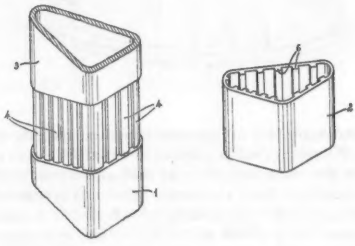
retaining means so as to constrain relative movement between the first and second clip members in one direction but allow relative movement in the opposite direction.

4,249,357

SYNTHETIC-RESIN ROAD MARKER AND METHOD OF MOLDING SAME

Jean Cornou, Verrieres le Buisson, France, assignor to Allibert Exploitation, Societe Anonyme, Grenoble, France

Filed Sep. 28, 1978, Ser. No. 946,603
Claims priority, application France, Oct. 12, 1977, 77 31384
Int. Cl.³ G09F *15/00;* **E01F** *9/10, 9/06;* **B29B** *7/20*
U.S. Cl. 52—728 **3 Claims**



1. A synthetic-resin body comprising:
a synthetic-resin tubular lower part;
a synthetic-resin tubular upper part spaced longitudinally from said lower part and of substantially the same cross-section as said lower part;
a plurality of longitudinally extending strip webs unitary with and interconnecting said upper and lower parts; and
a tubular middle part between said upper and lower parts, of substantially the same external cross-sectional shape as said upper and lower parts, and formed with inwardly open grooves complementary to and snugly receiving said webs.

4,249,358

PROCESS AND INSTALLATION FOR MOULDING PAVING STONES OR SLABS

Luc Thieffry, Barcelona, Spain, assignor to "P.B.I." Procedes et Brevets Industriels, Luxembourg, Luxembourg

Filed Jan. 4, 1979, Ser. No. 924
Claims priority, application France, Jan. 6, 1978, 78 01017
Int. Cl.³ B28B *1/04, 3/04, 3/08*
U.S. Cl. 52—745 **16 Claims**

1. Process for the laying of products obtained from an apparatus for molding paving stones or slabs from moldable material, wherein the apparatus comprises a grid member carrier, a unitary grid member of a set of different shaped interchangeable grid members removably mounted on said grid member carrier, said grid member, said carrier, and a bottom plate

forming a mold having a plurality of mold cavities, a support member, and a plurality of removable ramming plates mounted on the support member above the grid member, the plates being interchangeable and selected in order that they correspond in shape and dimensions to the shape and dimensions of the underlying mold cavities, said process comprising grasping, transferring and depositing plates composed of individual

modular paving stones or slabs or the grooved monolithic modular plates by the handling device provided with a plurality of suction cups, wherein the suction cups are distributed in such manner that their centers correspond to the fixed centers of the modules of the pattern adopted for the construction of the interchangeable grids of the molds which serve for the manufacture of the said plates.

4,249,359

APPARATUS FOR THE COILING OF WIRE-MESH WEBS, ESPECIALLY CHAIN-LINK FENCING, INTO COMPACT ROLLS

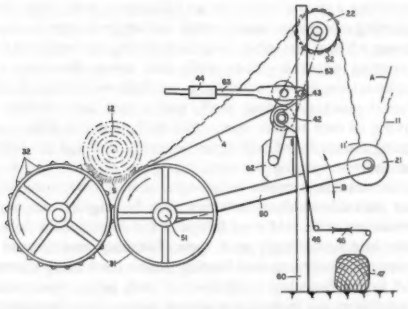
Klaus Herrig, and Heinz Wagner, both of St. Ingbert, Fed. Rep. of Germany, assignors to Acieries Reunies de Burbach-Eich-Dudelange S.A. Arbed, Luxembourg

Division of Ser. No. 848,324, Nov. 3, 1977, Pat. No. 4,139,976. This application Dec. 8, 1978, Ser. No. 967,849

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1976, 2650590

Int. Cl.³ B65B *63/04*

U.S. Cl. 53—118 **3 Claims**



1. An apparatus for the coiling of a roll of a chain-link wire-mesh web comprising:

a pair of rotary bodies including an upstream body and a downstream body rotatable at a relatively high speed and a relatively low speed respectively;

means for feeding said web into contact with said upstream body whereby said web is coiled into a roll cradled between said bodies with successive flattened spiral coils forming the web packed tightly together and twisted out of the plane of the web;

means for introducing into said roll a tension strand connected to a first of said spiral coils and coiled in said roll with said coils to guide the successive flattened spirals to maintain the orientation thereof; and

means for synchronizing said feeding means and said introducing means to maintain a predetermined tension on said strand as the different speeds of said bodies ensures twisting of the successive flattened spirals out of the plane of the web pack said spirals together, the last-mentioned means including a pair of rollers feeding said strand between them, one of said rollers being driven, the other of said rollers being urged by a force toward said one of said rollers.

4,249,360

TRANSPORT APPARATUS FOR A CARTON FILLING MACHINE

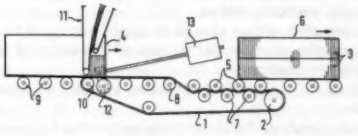
Hartmut Klapp, Kaarst, Fed. Rep. of Germany, assignor to Jagenberg-Werke AG, Dusseldorf, Fed. Rep. of Germany

Filed Mar. 20, 1979, Ser. No. 22,139

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1978, 2825646

Int. Cl.³ B65B *5/10, 39/12;* B65G *23/04*

U.S. Cl. 53—244 **5 Claims**



1. Transport apparatus for transport containers in the area of a carton filling machine where blanks are placed in the transport containers, comprising:

a plurality of first free-wheeling transport rollers in a loading area;

first and second diverting rollers;

a plurality of rollers outside said loading area which are driven by means of a drive belt;

said drive belt being positioned outside the loading area and running under the driven rollers, said drive belt being raised to pass over said first diverting roller at the beginning of said loading area and then being returned at the end of the loading area by passing over said second diverting roller; and

a second free-wheeling reverse transport roller in close proximity to said second diverting roller, said free-wheeling reverse transport roller being normally not in contact with the drive belt and being arranged beneath said drive belt and being movable into engagement with said drive belt, and slightly above said plurality of freewheeling rollers.

4,249,361

METHOD OF FULLY AUTOMATICALLY FILLING AND CLOSING LARGE SACKS

Konrad Tetenborg, and Helmut Huwelmann, both of Lengerich, Fed. Rep. of Germany, assignors to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Apr. 27, 1979, Ser. No. 34,025

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1978, 2818552

Int. Cl.³ B65B *51/08*

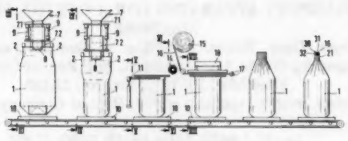
U.S. Cl. 53—415 **5 Claims**

1. A method of filling and closing large sacks, each large sack having a tube section including side walls, a base, and an open end portion to receive material to be poured therein, the method comprising the steps of:

engaging the open end portion of the sack at opposite sides thereof and opening the side walls of the sack;

freely suspending the sack from its open end portion;

depositing a pourable material through the open end portion of the freely suspended sack to partially fill the sack;
gradually lowering the sack onto a support when a predetermined weight of material is deposited therein while maintaining tension on the side walls of the sack;
laying together, stretching and inclining sideways through an angle, the sack walls disposed above the pourable material within the sack;
folding the upper end portion of the sack over onto itself;
placing closure tape onto the folded-over end portion of the sack and one sack wall;
welding the folded-over end portion to the sack wall;



moving the inclined side wall portion of the sack, disposed above the poured material, through an angle to a substantially vertical position;
placing closure tape around an upper portion of the sack;
folding the empty upper portion of the sack and tape in a zig-zag manner;
pulling the zig-zag folded portion together to form a frill; and
welding ends of the closure tape projecting beyond sides of the flattened filling side to each other to thereby secure the frill against springing open.

4,249,362

CAPPING MACHINERY

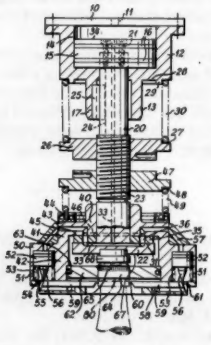
Thomas D. Brownbill, West Bromwich, England, assignor to Metal Closures Group Limited, London, England

Filed Nov. 14, 1978, Ser. No. 960,666

Claims priority, application United Kingdom, Mar. 22, 1978, 11402/78

Int. Cl.[3] B67B *3/20*; B65B *7/28*

U.S. Cl. 53—490 **36 Claims**



1. A method for applying a threaded closure to a container, said closure having sealing means in or towards the crown thereof, which method comprises applying the closure to the container by the application of a predetermined rotary torque thereto, continuing the application of the closure to the container until the desired torque applied is obtained and thereafter applying axial pressure independently to the closure crown towards and on to the container while simultaneously applying said torque whereby the closure pressure serves to disengage the threads to overcome at least some of the friction therebetween to permit a greater proportion of the applied torque to be applied to the sealing means within the closure.

4,249,363

INCORRECT COIN NUMBER DETECTOR FOR COIN WRAPPING MACHINE

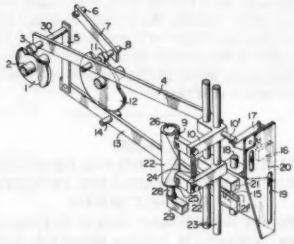
Yorizo Miyazaki, Tokyo, Japan, assignor to Laurel Bank Machine Co., Ltd., Japan

Filed Sep. 17, 1979, Ser. No. 76,145

Claims priority, application Japan, Sep. 18, 1978, 53-127788[U]

Int. Cl.[3] B65B *57/18*

U.S. Cl. 53—508 **3 Claims**



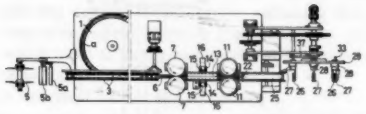
1. An incorrect coin number detector for use with a coin wrapping machine, comprising: fastening means for fastening the both ends of the wrapping paper, in which a preset number of piled coins are wrapped, said fastening means including a movable shaft, a fastening lever made rotatable about said movable shaft, an upper fastening arm connected to one end of said fastening lever and having an upper fastening claw, a shaft providing a pivotal point for said fastening lever, and a lower fastening arm made coactive with said upper fastening arm and having a lower fastening claw for fastening the both end of the wrapping paper together with said upper fastening claw; stroke setting means including a cam follower mounted on the pivotal point providing shaft, and a coin kind setting cam having its cam surface contacting with said cam follower for setting the stroke of said upper fastening arm and accordingly the shortest spacing between the upper and lower fastening claws; actuating means including a cam follower mounted on said movable shaft, a fastening cam having its cam surface contacting with said cam follower for turning said fastening lever and accordingly said upper fastening arm toward said lower fastening arm, and biasing means for biasing the upper and lower fastening arms toward each other; incorrectness detecting means including a support arranged in the vicinity of said upper fastening arm, a detecting switch mounted on said support for generating, when actuated, signals indicative of the incorrectness in the number of the piled coins being wrapped, and an actuating lever mounted on said support for actuating said detecting switch when it is pushed by said upper fastening arm; and positioning means for determining the relative position of said actuating lever to said upper fastening arm in accordance with the correct length of the piled coins, said positioning means including a position change lever having its one end connected to said support, and a connecting lever connected pivotally to said pivotal point providing shaft and connected to the other end of said position change lever.

4,249,364

HEAT-SEAL TYPE WRAPPING APPARATUS

Kaoru Kawasaki, and Masakazu Umehara, both of Osaka, Japan, assignors to Tenchi Kikai Kabushiki Kaisha, Fukai, Japan

Filed Jul. 19, 1979, Ser. No. 59,271
Claims priority, application Japan, Jul. 20, 1978, 53-88875
Int. Cl.[3] B65B 9/08
U.S. Cl. 53—550 4 Claims



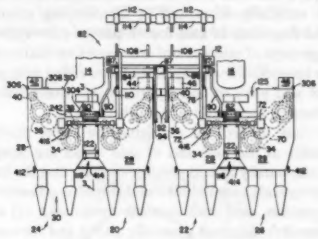
1. A heat-seal type wrapping apparatus comprising:
a reel on which a long plastic film is wound so that it can be delivered;
a feed section at which pieces of candy are fed one by one onto a feed gutter;
a plurality of push feed rods for pushing the pieces of candy out of the feed gutter at regular intervals in the direction of delivery of the plastic film;
said push feed rods being driven by an endless chain;
a former for receiving the plastic film from the terminal end of the feed gutter to wind it into a cylinder, with the overlapping margins of the film directed upwardly;
said former being composed of two split members facing the path of travel of the plastic film and urged by a spring to wrap the pieces of candy fed by the push feed rods in the plastic film being cylindrically wound and to nip the wrapped pieces of candy exteranally of the plastic film;
a pair of delivery discs for delivering the plastic film by nipping said overlapping margins;
a longitudinally heat sealing device comprising a pair of heat sealing discs rotatable with electric heaters contained therein, said discs being urged to nip the overlapping margins of the plastic film therebetween to heat-seal the same;
a transversely heat sealing device comprising a pair of rotary blocks vertically arranged across the path of travel of the plastic film, each block having a heating nip surface containing an electric heater and a cutting edge at the center of said surface, the arrangement being such that said heating nip surfaces nip the cylindrical plastic film to heat-seal the latter and the cutting edges cut the transversely heat sealed portion at its middle;
a preheating device installed downstream of the longitudinally heat-sealing device, comprising a pair of preheaters disposed on both sides of the path of travel of the overlapping margins of the cylindrically formed plastic film, and electric heater for heating said preheaters to a suitable temperature, said preheaters being spaced a suitable distance from each other not to interfere with the travel of the overlapping margins to preheat the latter; and
a preheating device installed downstream of the transversely heat-sealing device, comprising a plurality of clamp members circumferentially equispaced on a rotary disc, and a face cam, each clamp member having a jaw defining a circular path of the cylindrical plastic film and a second jaw adapted to open and close with respect to said first jaw under the control of said face cam as the rotary disc is rotated, said pair of jaws being adapted to nip the cylindrical plastic film therebetween at a place on said film between adjacent wrapped pieces of candy and transversely of the film, at least one of said jaws containing an electric heater for preheating the film to a suitable temperature.

4,249,365

COTTON HARVESTER

Arthur L. Hubbard; Russell D. Copley, and Merle D. Nieman, all of Ankeny, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Dec. 5, 1979, Ser. No. 100,317
Int. Cl.[3] A01D 45/18
U.S. Cl. 56—13.2 51 Claims



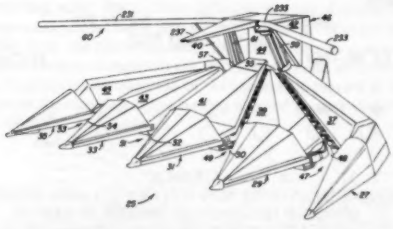
1. A cotton harvester for use in a field with parallel rows of cotton plants, comprising: a main frame, a pair of frame-carrying wheels spaced for embracing two adjacent rows, a pair of inner harvesting units carried forwardly on the frame between the wheels, each unit having a plant-receiving opening for receiving one of the adjacent rows and means for removing the cotton from the row, an outboard harvesting unit, and means for supporting the outboard harvesting unit outwardly of one of the inner units in cantilever fashion, said outboard unit including means for removing the cotton from a row outside the two adjacent rows.

4,249,366

FORAGE HARVESTER HEADER WITH UPPER STALK CONTROL

Dale R. Dolberg, Hedrick, and Jack L. Guiter, Ottumwa, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Sep. 11, 1979, Ser. No. 74,561
Int. Cl.[3] A01D 45/00
U.S. Cl. 56—98 1 Claim



1. In a header for a row crop harvester with a crop receiving throat, said header comprising:
a plurality of generally fore-and-aft, downwardly and forwardly inclined crop dividers, said dividers converging at the rear ends thereof;
a plurality of crop receiving, converging passageways defined between adjacent ones of said dividers each passageway having a crop entry and a crop exit at the forward and rearward ends thereof, respectively, said exits disposed adjacent to said throat;
cutter means disposed adjacent the crop entry of each passageway for severing crop;
a frame comprised of two sections;
a pair of conveyors respectively disposed on opposite sides of each passageway for conveying severed crop along said passageway and into said throat, a first and second pair of

said conveyors mounted on one of said frame sections and corresponding to a first and second of said passageways, a third and fourth pair of conveyors mounted on the other of said frame sections, and corresponding to a third and fourth of said passageways, the rear ends of said second pair of conveyors spaced vertically from and in overlapping relationship with the rear ends of said first pair of conveyors, the rear ends of said third pair of conveyors spaced vertically from and in overlapping relationship with the rear ends of said fourth pair of conveyors;

the passageways of said pairs of conveyors on said one frame section intersect forwardly of said throat and said passageways of said pairs of conveyors on said other frame section intersect forwardly of said throat; and

an upper stalk control for engaging the upper portions of crop stalks as the butt and of said stalks are being conveyed rearwardly in said passageways so that the butt end of the crop stalks are fed into said throat in advance of the upper portion, said stalk control comprising (1) a transverse member disposed generally above and forwardly of the crop exits of said passageways, and (2) two outwardly and forwardly diverging arms attached to respective ends of said transverse member, said arms respectively generally parallel to and above said first and fourth crop dividers, wherein the improvement comprises:

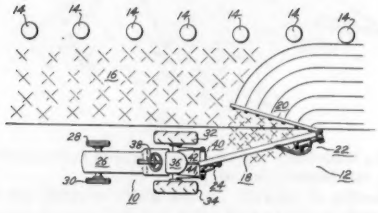
said stalk control having a centrally disposed wedge member attached to said transverse member and extending forwardly therefrom in generally parallel alignment with the crop divider disposed between said second and third passageways, said wedge member dividing the upper portions of stalks in said first and second passageways from those in said third and fourth passageways.

4,249,367

BRUSH WINDROWER

Mike D. Layman, 1318 Towline Rd., Benton Harbor, Mich. 49022

Filed Sep. 10, 1979, Ser. No. 74,398
Int. Cl.[3] A01D *7/02*
U.S. Cl. 56—365 **16 Claims**



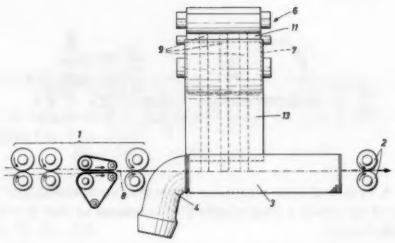
1. A brush windrower to be towed behind a tractor to accumulate branches lying on the ground beneath orchard and nut trees, comprising a main frame extending rearwardly from the tractor, a means for connecting said main frame to the tractor, a rake bar connected to said main frame and extending outwardly therefrom to pass underneath the overhanging limbs from the trees, a plurality of rake teeth extending downwardly from said rake bar to accumulate the branches as said windrower is towed forward,and a means for removing said rake teeth from the accumulated pile of branches during the discharge phase of operation.

4,249,368

APPARATUS FOR MANUFACTURING A YARN

Ernst Fehrer, Auf der Gugl 28, A-4020 Linz, Austria

Filed Mar. 30, 1979, Ser. No. 25,369
Claims priority, application Austria, May 26, 1978, 3813/78; Aug. 28, 1978, 6228/78; Sep. 8, 1978, 6490/78
Int. Cl.[3] D01H *1/12;* D02G *3/36*
U.S. Cl. 57—5 **10 Claims**



1. Apparatus for manufacturing yarn, comprising two juxtaposed, closely spaced vacuum drums which define an open-topped triangular space between them and have suction zones adjoining said triangular space and facing each other,

a drawing frame for delivering a drawn sliver to said triangular space at one end thereof, said drums being rotatable in the same sense to twist said sliver so as to form a yarn,

means for withdrawing said yarn from said triangular space at the opposite end thereof, whereby said sliver is caused to extend in said triangular space in the longitudinal direction of said drums, and

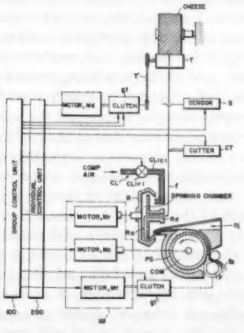
at least one roller drawing frame having a delivery end disposed over said triangular space and operable to deliver at least one stream of drawn wrapping fibers oriented substantially parallel to each other and transversely to the longitudinal direction of said drums to said sliver in said triangular space.

4,249,369

CENTRALIZED CONTROL SYSTEM FOR OPEN END SPINNING MACHINES

Kanemitsu Tsuzuki, Kariya; Kozo Motobayashi, Kasuga; Kazuo Watanabe, Bisai; Yastami Kito, Kasuga, and Shigeo Seko, Hino, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoh Shokki Seisakusho and Kabushiki Kaisha Meidensha, both of, Japan

Filed Sep. 10, 1979, Ser. No. 73,639
Int. Cl.[3] D01H *15/02, 1/244, 13/16*
U.S. Cl. 57—263 **7 Claims**



1. A centralized control system for open end spinning machine comprising

(a) a group control unit comprising

(a-1) a first variable frequency power supply connected to a plurality of spinning units

(a-2) a first spinning control means composed of a plurality of sequentially operated logical elements connected in series, said first spinning control means producing from the final-stage logical elements a command which is fed to said first power supply so as to increase the operational frequency of said power supply, said first spinning control means further producing from the respective logical elements parallel outputs each of which is fed to said spinning units so as to control the spinning operation thereof,

(b) an individual control unit comprising

(b-1) a second variable frequency power supply connected to a plurality of spinning units

(b-2) a second spinning control means, which operates in response to a detecting signal of yarn breakage occurred in any one of said spinning units, composed of a plurality of sequentially operated logical elements connected in series, said second spinning control means producing from the final-stage logical elements a command which is fed to said second power supply so as to increase the operational frequency of said second power supply, said second spinning control means further producing from the respective logical elements parallel outputs each of which is fed to the spinning unit in which yarn breakage is occurred in order to control the starting state of the spinning operation during which operation the repair of yarn breakage is effected,

(b-3) a synchronizing detecting means producing an output when the operational frequency of said second power supply in said individual control unit becomes equal to the operational frequency of said first power supply in said group control unit,

(b-4) a switching means for changing the control of the spinning unit in which the repair of yarn breakage has been effected from said individual control unit to said group control unit in response to the output of said synchronizing detector, and

(c) said plurality of spinning units each of which comprises

(c-1) a spinning mechanism for rendering sliver of fibers spun to form a spun yarn and taking up the spun yarn onto a take-up means,

(c-2) said spinning mechanism including a yarn breakage sensor provided in the stream of spun yarn,

(c-3) a driving means for driving said spinning mechanism including a plurality of driving motors controlled by the output from said first or second variable frequency power supply,

wherein when there is no yarn breakage in any one of the spinning units of the plurality, the spinning units are all controlled by said group control unit, while when there occurs yarn breakage detected by said yarn breakage sensor in any one of the spinning units of the plurality, only the spinning unit in which yarn breakage is occured is shifted from the control of said group control unit to the control of said individual control unit while the remaining spinning units in which no yarn breakage is occured remain under the control of said group control unit, and then after yarn breakage occured in the spinning unit is repaired under the control of said individual control unit, the spinning unit in which the repair of yarn breakage is effected is for a second time shifted to the control of said group control unit.

4,249,370

METHOD OF AND APPARATUS FOR REMOVING DIRT PARTICLES FROM STAPLE FIBERS AND FOR STRAIGHTENING SAID FIBERS IN AN OPEN-END SPINNING PROCESS

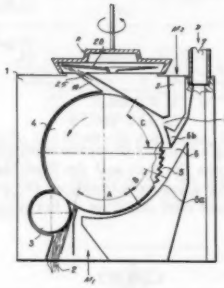
Milos Vecera, and Josef Skala, both of Usti near Orl., Czechoslovakia, assignors to Vyzkumny ustav bavlnarsky, Usti nad Orlici, Czechoslovakia

Filed Jul. 17, 1979, Ser. No. 58,317

Claims priority, application Czechoslovakia, Jul. 14, 1978, 4711-78

Int. Cl.³ D01H *7/888, 7/898*

U.S. Cl. 57—301 **8 Claims**



1. In a method of twisting fibers in an open-end spinning unit, said unit having a sliver feeding device, a fiber separating device, and a twist forming element, wherein the sliver supplied by the feeding device to the separating device contains fibers and dirt particles, and the separating device comprises a rotating combing roller which opens the fibers of the sliver and loosens and separates the dirt particles therefrom, the improvement which comprises subjecting the opened fibers and the dirt particles separated therefrom to a first air current flowing in the direction of rotation of the surface of the combing roller, expanding said first air current as it travels with the surface of the combing roller so as to decelerate such current to cause it to separate both coarse and fine dirt particles from the fibers on the combing roller due to their different inertias, drawing off the separated dirt particles, and after the drawing off of the dirt particles from the fibers exposing the clean fibers to a second air current which straightens the fibers, the second air current at the location of introduction of the second air current to the surface of the combing roller having a speed greater than the speed of the first air current.

4,249,371

METHOD AND APPARATUS FOR DISSIPATING HEAT IN GAS TURBINES DURING SHUT-DOWN

Norbert Romeyke, Lampertheim, Fed. Rep. of Germany, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Jun. 22, 1978, Ser. No. 918,156

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1977, 2728382

Int. Cl.³ F02C *6/00*

U.S. Cl. 60—39.04 **11 Claims**

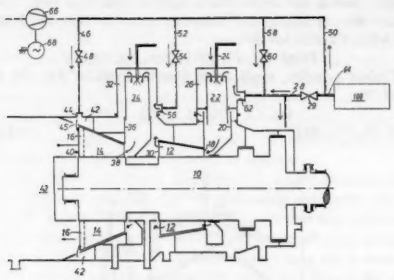
1. An apparatus for dissipating heat in a gas turbine engine resulting from a deceleration of turbine components, comprising:

a gas turbine engine having at least one turbine stage and having combustor means for supplying hot propellant gas to said turbine stage during operation of the gas turbine engine;

a source of coolant gas under pressure; and

means for selectively supplying said coolant gas to said turbine stage at a temperature below a temperature of the

hot propellant gas when the flow of said hot propellant gas is discontinued, said means for selectively supplying said coolant gas including; an annular duct surrounding a final blade ring of the at least one turbine stage, the annu-



lar duct having a plurality of apertures providing communication between the duct and the final blade ring, and valve means for selectively supplying the coolant gas to the annular duct after the flow of hot propellant gas is discontinued.

4,249,372

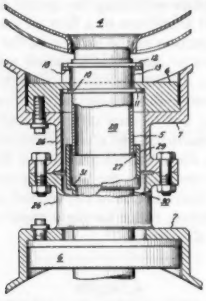
CROSS-IGNITION ASSEMBLY FOR COMBUSTION APPARATUS

Loren H. White, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 16, 1979, Ser. No. 57,722

Int. Cl.[3] F02C *7/00*

U.S. Cl. 60—39.32 **11 Claims**



1. A cross-ignition assembly for combustion apparatus having a pair of adjacent combustors with aligned fluid passages, comprising:

a pair of mounting means each disposed about the fluid passage in one of said combustors;

a cross-fire tube comprising a pair of coaxial telescoping tubular members, each of said tubular members having its outer end extending through one of said mounting means and into one of said adjacent combustors for establishing a conduit therebetween, and each of said tubular members having a first shoulder adjacent its outer end and a second shoulder spaced from said first shoulder engaging one of said mounting means;

and a pair of leaf springs each positioned between the first shoulder of one of said tubular members and a respective one of said mounting means for biasing said second shoulders of said tubular members into engagement with said mounting means and thereby effecting a cantilever support for each end of said cross-fire tube.

4,249,373

GAS TURBINE ENGINE

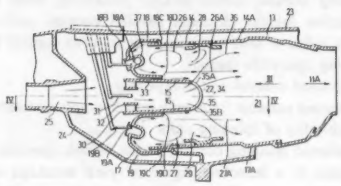
Arthur Sotheran, and David H. Parnell, both of Bristol, England, assignors to Rolls-Royce Ltd., London, England

Filed Jan. 22, 1979, Ser. No. 5,242

Claims priority, application United Kingdom, Jan. 28, 1978, 3548/78

Int. Cl.[3] F23R *3/30, 3/50*

U.S. Cl. 60—39.36 **4 Claims**



1. A gas turbine engine comprising a compressed air delivery duct having an outlet, a combustion chamber having an upstream end wall facing said outlet, a pre-mixing duct defined by side walls extending substantially linearly from said end wall into said chamber and defining a mean direction of flow, the chamber defining pilot sections at opposite sides of the pre-mixing duct and further defining a main section downstream of the pilot sections and of the pre-mixing duct, means provided at said end wall for introducing a pilot mixture of fuel and air into the pilot sections, the pre-mixing duct having an upstream end defining an air inlet opening and positioned to receive air from said outlet of the air delivery duct, the pre-mixing duct further having a downstream end defined by means defining outlet openings dimensioned to restrict flow from the pre-mixing duct and positioned to face across said pilot sections, means for igniting the pilot mixture to generate pilot flame, means for introducing fuel into the pre-mixing duct at said opening thereby to generate in the pre-mixing duct a pre-mixture of fuel and air which is lean compared to the pilot mixture and which is dischargeable through said outlet openings into said pilot flame as the latter passes from said pilot sections into said main section.

4,249,374

SPLIT ENGINE CONTROL SYSTEM WITH EXHAUST GAS RECIRCULATION

Fukashi Sugasawa, Yokohama; Haruhiko Iizuka; Junichiro Matsumoto, both of Yokosuka, and Yukihiro Etoh, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 11, 1979, Ser. No. 2,632

Claims priority, application Japan, Jan. 12, 1978, 53-2273[u]

Int. Cl.[3] F01N *3/15;* F02D *17/00*

U.S. Cl. 60—276 **3 Claims**

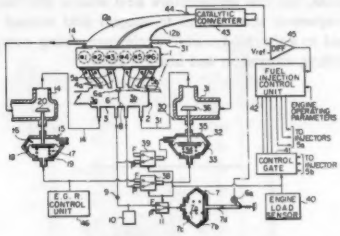
1. A control system for an internal combustion engine having first and second cylinders, an intake manifold having a first chamber portion connected to said first cylinder and a second chamber portion connected to said second cylinder, said first and second chamber portions being connected together in response to a relatively high engine load to allow introduction of air to said first and second cylinders, and means for deactivating said second cylinder in response to a relatively low engine load, comprising:

a shut-off valve responsive to said low engine load for isolating said first and second chamber portions from each other to prevent introduction of air into said second cylinder while allowing introduction of air into said first cylinder through said first chamber portion and responsive to said high engine load for allowing introduction of air into

said first and second cylinders through said first and second chamber portions;

first exhaust gas recirculating means for recirculating a part of the exhaust gases through said first chamber portion and said first cylinder;

second exhaust gas recirculating means for recirculating a



part of the exhaust gases through said second chamber portion and said second cylinder; and

means responsive to said low engine load for detecting a difference in pressure between said first and second chamber portions and correspondingly regulating said gases recirculated through said second chamber portion to reduce said pressure difference substantially to zero.

4,249,375

HEAT EXCHANGER

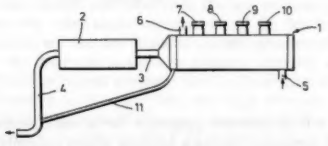
Edgard Grundmann, Wolfsburg; Udo Herbst, Brunswick, and Horst Pommerenke, Gifhorn, all of Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Apr. 18, 1978, Ser. No. 897,646

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1977, 2717159

Int. Cl.[3] **F01N** *3/02, 7/16;* **F28F** *9/02*

U.S. Cl. 60—309 **4 Claims**



1. A heat exchanger comprising in combination

(a) an elongated housing including means defining an inlet for passing through said housing a first medium which is to be heated;

(b) passage means accommodated within said housing for being surrounded by said first medium passing through said housing; said passage means including

(1) a central conduit extending substantially medially of said housing in the length dimension thereof; said central conduit having a closed end and an open end;

(2) a plurality of outer conduits extending substantially parallel to and spaced from said central conduit; said outer conduits surrounding said central conduit as a group; each said outer conduit having first and second open ends; said first open ends being arranged in the zone of said open end of said central conduit and said second open ends being arranged in the zone of said closed end of said central conduit;

(3) a vessel defining a header chamber into which merge said open end of said central conduit and said first open ends of said outer conduits;

(c) at least one inlet conduit projecting into said housing from the outside thereof and merging into said central conduit in a radial orientation with respect thereto at a location spaced from said closed end thereof for being surrounded by said first medium passing through said housing and for introducing into said passage means a second medium which is to be cooled; and

(d) an outlet conduit into which merge said second open ends of all of said outer conduits for withdrawing said second medium from said passage means.

4,249,376

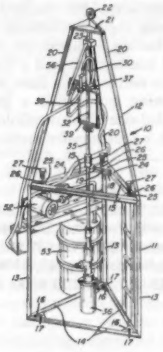
PUMP JACKS

Darl E. Weckerly, c/o Weckerly Associates, 388 Seneca St., Oil City, Pa. 16301

Filed Jun. 13, 1978, Ser. No. 914,994

Int. Cl.[3] **F01L** *25/08;* **F04B** *47/04*

U.S. Cl. 60—369 **7 Claims**

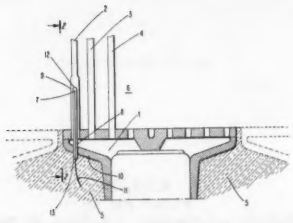


1. A pump jack for pumping oil and like wells having a polish rod extending vertically out of a well casing comprising a movable ground supported frame fitting over said well, a universal connector means attached to said frame, a hydraulic cylinder, said hydraulic cylinder depending at one end from said universal connector means generally coaxially of said polish rod, a piston movable in said cylinder and having a piston rod extending from the other end of said cylinder and engaging said polish rod, a plate means connected to said other end of said cylinder, a source of high pressure fluid connected to said cylinder for raising said piston in the cylinder, a solenoid operated dump valve mounted on said plate means simultaneously discharging the raising fluid from said cylinder and by-passing fluid from said source of high pressure fluid back to said source of high pressure fluid, a limit switch means mounted on said plate means for controlling said solenoid operated valve, means on said piston rod selectively actuating said dump valve by engagement with said limit switch means from a first position wherein all fluid from the source of high pressure fluid is delivered to one side of the cylinder for raising the piston to a second position wherein all fluid from the source and from said one side of the piston is simultaneously returned to the source whereby the piston and polish rod are successively raised by the high pressure fluid and the piston is lowered by the weight of the polish rod vertically relative to the cylinder.

4,249,377
TEMPERATURE SENSING DEVICE FOR A HOT GAS ENGINE HEATER HEAD

Jan C. Bratt, Gamlebäcksgatan 18, S-216 21 Malmö; Stefan Lorant, Oshögavägen 130, S 230 30 Oxie, and Kjell A. Pettersson, Hjortrogatan 28, S-234 00 Lomma, all of Sweden

Filed Dec. 21, 1978, Ser. No. 971,877
Int. Cl.[3] F02G *1/04*
U.S. Cl. 60—517 3 Claims



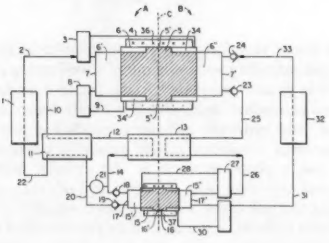
1. In a hot gas engine heater head wherein a working gas path between two variable volume chambers includes one side of a manifold and a plurality of heater tubes connected to the one side of the manifold and extending into a combustion gas flow path, the opposite side of the manifold being embedded in heat-insulating material, the improvement comprising:

an isolation tube having a closed end extending coaxially into one of said heater tubes and a thermo-couple coaxially positioned in said isolation tube, the other end of the isolation tube being mounted in a gas-tight connection with the embedded side of the manifold, said isolation tube being filled with a heat-transfer medium.

4,249,378
THERMALLY ACTUATED HEAT PUMP

Glendon M. Benson, 463 Veda Dr., Danville, Calif. 94526

Continuation-in-part of Ser. No. 937,902, Aug. 29, 1978, abandoned. This application Aug. 31, 1979, Ser. No. 71,470
Int. Cl.[3] F01B *29/10;* F25B *9/00;* F02G *1/04*
U.S. Cl. 60—525 29 Claims



1. A thermal machine comprising:

a positive displacement element which oscillates at a damped resonant frequency;

means for defining expander and compressor subchambers having volumes controlled by the positive displacement element;

heat exchange means including a high temperature heat source, a low temperature heat source, and at least one heat sink;

valve means for controlling the flow of fluid into and out of the expander subchamber so that said subchamber expands fluid therein;

means for compressing a fluid;

a first working fluid cycled in series through the expander subchamber, one of said heat sinks, the compressing means, the high temperature heat source and back to the expander subchamber to subject the first working fluid to a thermodynamic cycle comprising expansion, cooling, compression and heating steps;

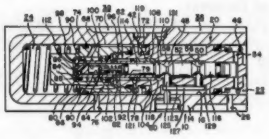
means for expanding a fluid; and

a second working fluid cycled in series through the compressor subchamber, one of said heat sinks, the expanding means, the low temperature heat source and back to the compressor subchamber to subject said second working fluid to a thermodynamic cycle comprising compression, cooling, expansion and heating steps.

4,249,379
FLUID PRESSURE GENERATOR AND VALVE MEMBER THEREFOR

Robert F. Gaiser, Stevensville, and Larry G. Lohraff, Berrien Spring, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Aug. 23, 1978, Ser. No. 936,272
Int. Cl.[3] B60T *11/20*
U.S. Cl. 60—562 9 Claims

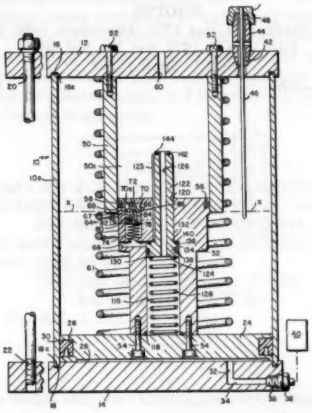


1. In a fluid pressure generator for a brake assembly, said pressure generator having a housing which movably carries a first and a second piston, the first piston cooperating with the housing and the second piston to substantially define a primary chamber and the second piston cooperating with the housing to substantially define a secondary chamber, the first piston being movable within the housing to pressurize fluid within the primary chamber and the second piston being movable in response to the pressurized fluid within the primary chamber to pressurize fluid within the secondary chamber, the second piston carrying a valve assembly which is exposed to the secondary chamber, the improvement wherein the second piston includes passage means communicating the secondary chamber with the brake assembly via the valve assembly, said valve assembly being movable between a first position in which it is responsive to fluid pressure within said secondary chamber to substantially close said passage means when a predetermined pressure is reached in said secondary chamber and being shiftable to a second position in which said passages means communicates the secondary chamber with the brake assembly, said valve assembly including a sleeve with a bore and an opening, said sleeve being movable within the second piston, a pilot member shiftably received in said bore and cooperating with said sleeve opening to control fluid communication between the secondary chamber and the brake assembly.

4,249,380
TWO STAGE INTENSIFIER

Harold A. Melendy, Ashland, and Harold V. Hamilton, Bedford, both of Mass., assignors to Barry Wright Corporation, Watertown, Mass.

Filed Jul. 25, 1979, Ser. No. 60,676
Int. Cl.³ B60T *11/20*
U.S. Cl. 60—562 **17 Claims**



1. A two-stage pressure intensifier system comprising a low pressure chamber containing at one end a discharge port, a low pressure piston in the low pressure chamber movable therein in a direction to force fluid from the low pressure chamber through the discharge port, means for moving said low pressure piston, said low pressure piston containing a high pressure chamber, a high pressure piston in said high pressure chamber, said high pressure piston extending forwardly from the face of the low pressure piston into the low pressure chamber and being movable within and relative to the low pressure piston, a fluid reservoir, valve means associated with the low pressure piston operable on the one hand to permit pressure fluid to flow from the reservoir to the low pressure chamber and on the other hand to permit pressure fluid to flow from the low pressure chamber to the reservoir, said high pressure piston being operable when moved into engagement with the end of the low pressure chamber to block flow of fluid from the low pressure chamber through the discharge port and place the high pressure chamber in communication with the discharge port and wherein movement of the high pressure piston relative to the low pressure piston as the latter is moved forwardly toward the end of the low pressure chamber permits flow of fluid from the low pressure chamber to the reservoir and discharges fluid from the high pressure chamber through the discharge port at high pressure.

4,249,381
MASTER CYLINDER

Robert F. Gaiser, Stevensville, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 890,757, Mar. 27, 1978, abandoned. This application Jan. 7, 1980, Ser. No. 110,151
Int. Cl.³ B60T *11/20*
U.S. Cl. 60—562 **22 Claims**

1. A master cylinder comprising:

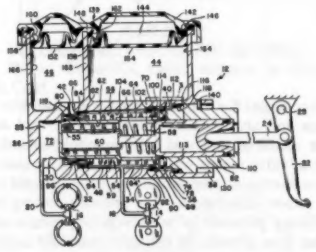
a housing having a tapered bore therein, said housing having first and second compensator ports for connecting said tapered bore to a fluid reservoir and first and second outlet ports connected to fluid pressure responsive devices;

a sleeve member located in said tapered bore having a plurality of openings through which fluid is communicated to said first outlet port;

first and second seals associated with said sleeve member having a plurality of radial grooves for establishing a definite flow path between the reservoir and the tapered bore;

bearing means engaging said sleeve member to hold said first and second seals in a stationary position within said bore;

piston means having a first cylindrical member located in said tapered bore by said bearing means, and a second cylindrical member located in said tapered bore by a lip on said sleeve member, said first and second cylindrical members engaging said first and second seals, respectively, and cooperating with said housing to define first and second chambers adjacent said first and second outlet ports respectively, each having a fluted section located on the end of said first and second cylindrical members for defining an extension between said definite flow path and the first



and second chambers, said second cylindrical member having a first diameter section and a second diameter section, said first diameter section having a lip on the peripheral surface thereof for engaging said sleeve member to hold the second diameter section in substantially the center of said bore in said second chamber;

a first spring located between said first and second cylindrical members to establish the size of said first chamber;

a second spring located between said lip on the first cylindrical member and said sleeve member for urging said first and second cylindrical members out of said first and second chambers toward a rest position; and

input means responsive to an input force for moving said piston means past said seals to interrupt communication between the reservoir and the bore and pressurizing the fluid in said first and second chambers to supply the fluid pressure responsive devices with an operational fluid pressure through said first and second outlet ports.

4,249,382
EXHAUST GAS RECIRCULATION SYSTEM FOR TURBO CHARGED ENGINES

Duane E. Evans; William L. Brown, Jr., both of Peoria, and Roger W. Johnson, Chillicothe, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 747,272, Dec. 3, 1976, abandoned. This application May 22, 1978, Ser. No. 908,414
Int. Cl.³ F02B *37/00*; F02M *25/00*
U.S. Cl. 60—605 **4 Claims**

1. In a turbocharged engine system comprising a piston-type engine with inlet manifold means, exhaust manifold means, turbine means arranged to be driven by exhaust gases from said exhaust manifold means and transmit a portion of the energy from said exhaust gases to drive compressor means between gas intake means and said inlet manifold means, an improvement wherein:

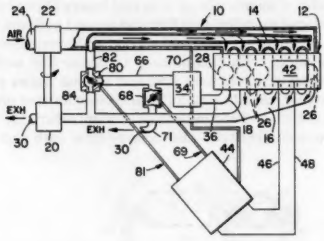
said exhaust manifold means comprises a first exhaust manifold receiving exhaust gases only from a first set of one or more pistons and a second exhaust manifold receiving

exhaust gases only from a second set of one or more pistons;

said turbine means comprises a first turbine driven by exhaust gases from said first exhaust manifold;

said compressor means comprises a first compressor driven by said first turbine; and

said system includes means for recycling a portion of the exhaust gases from said second exhaust manifold to said inlet means; and



including means for sensing pressure in said inlet manifold means and also including, intermediate said second exhaust manifold and said inlet manifold means, pressure control valve means which open and close said recycling means to exhaust responsive to pressure in said inlet manifold means, as sensed by said pressure sensing means, for stabilizing pressure in said recycling means at a value higher than pressure in said inlet manifold means.

4,249,383

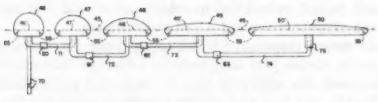
METHOD AND APPARATUS FOR OBTAINING ELECTRICAL POWER FROM SEA WATER AND OTHER LIQUIDS

Alberto E. Molini, 5335 Beeler St., Pittsburgh, Pa. 15217, and Clarence Zener, 3995 Bigelow Blvd., Pittsburgh, Pa. 15213

Filed Jun. 8, 1979, Ser. No. 46,667

Int. Cl.³ F03G *7/04*

U.S. Cl. 60—641 **7 Claims**



1. An improved method of producing electrical energy of the type comprising

i. conducting a warm liquid into a closed environment isolated from atmospheric pressure onto a foam generating means,

ii. conducting colder liquid into said closed environment,

iii. generating a foam in the evaporating warmer liquid,

iv. separating said foam into liquid and vapor phases,

v. conducting said liquid phase to turbine means,

vi. conducting said vapor phase to a condenser for condensing said vapor, and

vii. exhausting said liquid and condensed vapor,

wherein the improvement comprises repeating, at least once, the following steps:

(a) collecting rather than exhausting said liquid,

(b) conducting said liquid to a second closed environment isolated from atmospheric pressure,

(c) conducting warmer liquid into said closed closed environment and onto a foam generating means,

(d) generating a foam in the evaporating warmer liquid,

(e) separating said foam into liquid and vapor phases,

(f) conducting said liquid phase to turbine means,

(g) conducting said vapor phase to a condenser for condensing said vapor,

(h) exhausting said condensed vapor, and

(i) exhausting said liquid.

4,249,384

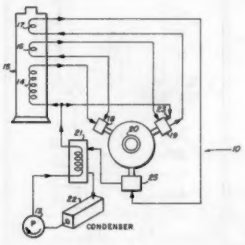
ISOTHERMAL COMPRESSION-REGENERATIVE METHOD FOR OPERATING VAPOR CYCLE HEAT ENGINE

Marion K. Harris, P.O. Box 1591, Atascadero, Calif. 93422

Filed Aug. 3, 1978, Ser. No. 930,745

Int. Cl.³ F01K *19/04*

U.S. Cl. 60—670 **11 Claims**



1. A method of operating a vapor cycle heat engine comprising the steps of:

(a) pumping a working substance into a boiler to raise the pressure of the substance to a predetermined value;

(b) heating the working substance in the boiler;

(c) expanding the working substance in a cylinder for driving a load;

(d) exhausting the working substance;

(e) recompressing the exhausted working substance in an isothermal recompression cylinder to a pressure below said predetermined value; and

(f) injecting a spray of recondensed working substance into the isothermal recompression cylinder for controlling temperature and for providing isothermal compression.

4,249,385

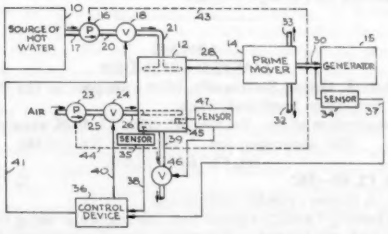
TWO-PHASE THERMAL ENERGY CONVERSION SYSTEM

Lawrence E. Bissell, 1242 26th St., Apt. B, Santa Monica, Calif. 90404

Continuation-in-part of Ser. No. 615,931, Sep. 23, 1975, Pat. No. 4,085,591. This application Apr. 25, 1978, Ser. No. 899,791

Int. Cl.³ F01K *21/04*

U.S. Cl. 60—674 **33 Claims**



1. A two-phase energy conversion system comprising:

(a) a source of a first fluid which is evaporable within a predetermined range of temperatures and pressures;

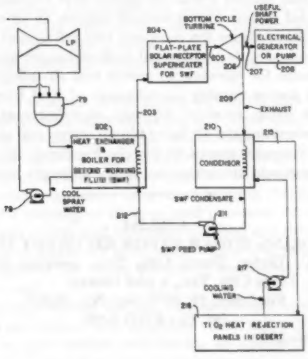
(b) a source of a second fluid consisting of a gas which is not liquefiable within said range;
(c) means for heating at least one of said fluids;
(d) means for mixing said fluids;
(e) means for supplying the fluids under pressure to the mixing means;
(f) a prime mover coupled to be driven by said mixture;
(g) sensing means for monitoring at least one operating condition of the prime mover; and
(h) control means responsive to the sensing means for controlling the ratio of flow rates of the first and second fluids to the mixing means so as to substantially saturate the second fluid with the first fluid over a pressure range up to twice the absolute pressure of the prime mover exhaust at equilibrium temperature.

4,249,386

APPARATUS FOR PROVIDING RADIATIVE HEAT REJECTION FROM A WORKING FLUID USED IN A RANKINE CYCLE TYPE SYSTEM

Phyllis S. Smith, and Otto J. M. Smith, both of 612 Euclid Ave., Berkeley, Calif. 94708

Filed Jun. 16, 1978, Ser. No. 916,135
Int. Cl.³ F28B *1/00, 7/00*
U.S. Cl. 60—693 **6 Claims**



1. In a Rankine-cycle heat engine system with a fluid condenser, means for rejecting the condenser heat comprising array of substantially horizontal panels arranged adjacent each other and exposed to visible light radiation from the sun, selective surface means on the upper side of said panel providing high reflectivity to said visible light radiation, said surface means also providing high infrared emissivity for electromagnetic radiation wave lengths in the infra-red spectrum, a heat transfer fluid, means for delivering said condenser heat to said heat transfer fluid, and thermal conduction means for carrying the thermal energy from said heat transfer fluid to said horizontal panels said large array of panels forming an effective horizontal radiation area of a plurality of acres for dissipating megawatts of thermal energy.

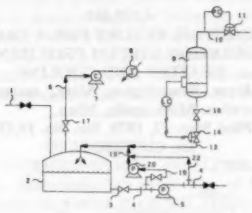
4,249,387

REFRIGERATION OF LIQUEFIED PETROLEUM GAS STORAGE WITH RETENTION OF LIGHT ENDS

Ralph P. Crowley, Woods Cross, Utah, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 27, 1979, Ser. No. 52,533
Int. Cl.³ F17C *7/02*
U.S. Cl. 62—54 **3 Claims**

1. A method for refrigerating a liquefied petroleum gas in storage which comprises taking vapor from vapor space in said storage, compressing the same, cooling the same, thus forming a condensate, admixing condensate thus obtained with liquefied petroleum gas taken from said storage and passing the admixture thus obtained into said storage.

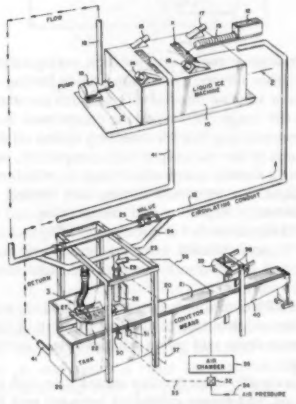


4,249,388

AUTOMATIC LIQUID ICE SYSTEM

Daniel E. Burns, Camarillo, Calif., assignor to Demco, Inc., Oxnard, Calif.

Filed Jan. 30, 1980, Ser. No. 116,820
Int. Cl.³ F25D *25/04*
U.S. Cl. 62—185 **6 Claims**



1. An automatic liquid ice system including, in combination:
(a) an icing machine for making liquid ice, said machine comprising a compartment with means for receiving crushed ice; means for pulverizing said ice; agitating means in said compartment for constantly stirring the water and ice to maintain it in a liquid state; a circulating conduit external of said compartment; and a liquid ice pump for pumping said liquid ice from said compartment through said circulating conduit and back to said compartment;
(b) a conveyor means having a work surface for moving boxes of various items to be refrigerated for shipment, said conveyor means further including an overhead structure supporting a portion of said circulating conduit above said work surface; and a liquid ice accumulating tank below said work surface; and
(c) liquid ice applicator means connected to said portion of said circulating means and including liquid ice valve means; and means for controlling said valve means automatically responsive to movement of said box on said work surface past a given position to apply liquid ice from said applicator means into said box to cover said items

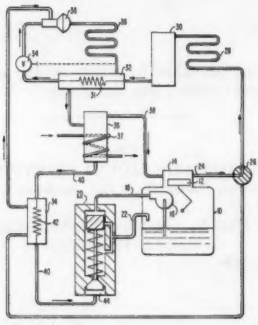
therein, excess liquid ice, if any, being collected in said accumulator tank for return of said compartment.

4,249,389

CRANKCASE OIL RETURN FOR A TRANSPORT REFRIGERATION SYSTEM PROVIDING BOTH HEATING AND COOLING

Donald K. Mayer, Bloomington, Minn., assignor to Thermo King Corporation, Minneapolis, Minn.

Filed Mar. 12, 1979, Ser. No. 19,531
Int. Cl.³ F25B *31/00*
U.S. Cl. 62—192 **4 Claims**



1. In a transport vapor compression refrigeration system operable in either a heating or cooling mode having a refrigerant compressor with an internal oil pump for circulating lubricating oil to the compressor when the compressor is operating, and an oil recirculating line for directing excess oil discharged from said pump to the oil sump of said compressor, said system also including a suction accumulator tank in which refrigerant vapor and liquid are separated during said heating mode for returning primarily vapor to said compressor and in which lubricating oil entrained in the circulating refrigerant from said compressor is accumulated prior to being returned to said compressor; and, an oil return line from said tank to said compressor;

a first normally closed valve means disposed in said recirculating line and movable to an open position in response to oil pressure from said pump whenever said compressor is operating;

a second normally closed valve means disposed in said oil return line, and means extending between said first valve means and said second valve means for moving said second valve means to an open position in response to said first valve means moving to an open position; and,

means for heating said return line at least during said heating mode of operation of said refrigeration system, whereby oil is returned to said compressor sump only during operation of said comressor and refrigerant in said oil is vaporized by said heating means to reduce the amount of liquid refrigerant returning to said compressor to a tolerable level.

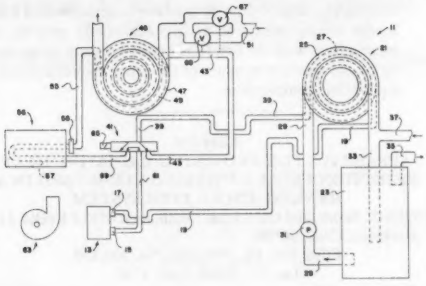
4,249,390

AIR CONDITIONING SYSTEM

William M. Jones, Country Club Rd., Pocahontas, Ark. 72455

Filed Aug. 23, 1979, Ser. No. 69,051
Int. Cl.³ F25B *27/02, 13/00*
U.S. Cl. 62—238 E **1 Claim**

1. An air conditioning system comprising, in combination: a refrigerant; a compressor means for compressing said refrigerant; a first water-refrigerant heat exchanger means for receiving said refrigerant from said compressor means and for regularly reducing the temperature of said refrigerant to below a certain predetermined degree; a hot water tank; a pump means for selectively pumping water from said hot water tank through said first water-refrigerant heat exchanger means to remove heat from said refrigerant received by said first water-refrigerant heat exchanger means; a second water-refrigerant heat exchanger means for receiving said refrigerant from said first water-refrigerant heat exchanger means; heat sensitive means for directing water through said second water-refrigerant heat exchanger means when the temperature of said refrigerant passing from said first water-refrigerant heat exchanger



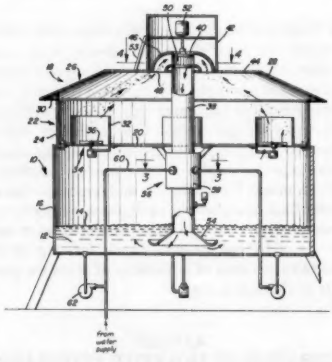
means to said second water-refrigerant heat exchanger means is above said certain predetermined degree; an air-refrigerant heat exchanger means for receiving said refrigerant from said first and second water-refrigerant heat exchanger means; and a blower means for blowing air across said air-refrigerant heat exchanger means causing an exchange of heat between said refrigerant being received by said air-refrigerant heat exchanger means and the air being blown across said air-refrigerant heat exchanger means to thereby condition the air being blown across said air-refrigerant heat exchanger means.

4,249,391

COOLING TOWER VAPOR RECOVERY UNIT

Michael C. Taylor, Texas City, Tex., assignor to Thomas Mackey, Texas City, Tex., a part interest

Filed Sep. 19, 1979, Ser. No. 76,927
Int. Cl.³ F28D *5/00*
U.S. Cl. 62—304 **10 Claims**



1. For use with a water cooling tower within which water is stored at a predetermined level, a vapor recovery unit comprising an enclosure mounted on the cooling tower blocking escape of vapor to atmosphere, an elongated, vertical conduit extending from the enclosure into the cooling tower below said level of the water therein, means inducing an accelerated flow of water vapor from the cooling tower through said

enclosure into the conduit for downflow of the vapor, and condensing means for cooling the downflowing vapor in the conduit to discharge a water condensate into the cooling tower below said level of the water therein.

4,249,392

CONSTANT TEMPERATURE BOX

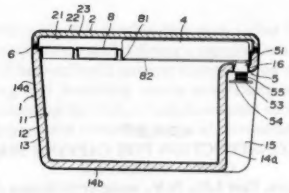
Masashi Hotta, Osaka, Japan, assignor to Shimano Industrial Company, Limited, Osaka, Japan

Filed May 22, 1979, Ser. No. 41,479

Claims priority, application Japan, May 22, 1978, 53-69270[U]; May 22, 1978, 53-69271[U]

Int. Cl.³ F25D *3/08, 3/10*; B67D *5/60, 5/64*

U.S. Cl. 62—457 **11 Claims**



1. A constant temperature box being portable and capable of receiving therein foodstuffs and beverages and maintaining them at a constant temperature, said box comprising:

(a) a body of adiabatic construction having an inner space for receiving foodstuffs and beverages, and having an open side;

(b) a lid of adiabatic construction for sealing said opening of said body, said lid maintaining said inner space air tight;

(c) clasps for holding said lid to said body;

(d) a cooling or heating source detachably supported within said space at said body, said source comprising a hollow and sealed container capable of keeping therein a beverage for cooling or heating, said container having a port through which said beverage is added and removed;

(e) support means for detachably supporting said container arranged at the upper portion of said space within said body, and

(f) discharge means having an inlet which communicates with said port of said container when said container is on said support means and serving to discharge from said container said beverage, said discharge means having a discharge pipe, said discharge pipe projecting from said body or lid so that said beverage may be discharged from said container when said lid is shut.

4,249,393

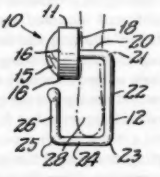
EARRING OR SIMILAR ARTICLE

Frank P. Ciambra, 772 Stewart St., Ridgefield, N.J. 07657

Filed Oct. 22, 1979, Ser. No. 87,314

Int. Cl.³ A44C *7/00*

U.S. Cl. 63—12 **3 Claims**



1. An improved earring for use with pierced ear lobes comprising: an ornament member having a generally planar rear surface; a unitary relatively stiff earring wire having a first end fixed to and extending substantially perpendicular to said planar rear surface, said first end leading to an open loop portion defining an enclosed area and terminating at a second end at a point forwardly of said rear surface, and in the area of said ornament member; whereby said enclosed area is of an effective width substantially greater than the width of an ear lobe and is of a size to accommodate the lower portion of the ear lobe so that contact with a lower peripheral edge of the lobe together with contact with the pierced portion of the lobe will provide a gentle purchase on the lobe in the absence of any compressive forces against the sides of the ear lobe.

4,249,394

FLEXIBLE SHAFT COUPLING

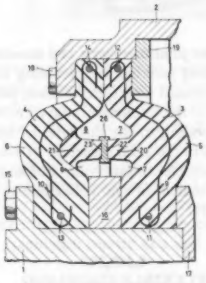
Jürgen Walter, Haltern-Hullern, Fed. Rep. of Germany, assignor to Hackforth GmbH & Co. KG, Herne, Fed. Rep. of Germany

Filed Mar. 27, 1979, Ser. No. 24,252

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1979, 2901219

Int. Cl.³ F16D *3/17, 3/28, 3/52*

U.S. Cl. 64—11 R **6 Claims**



1. In a flexible shaft coupling comprising a rigid hub coupling part, a rigid ring coupling part, which surrounds said hub part concentrically, two similar symetrically disposed resilient rings connecting said hub part to said rigid ring coupling part, said resilient rings bulging axially outwards away from each other to define a cavity there between, means clamping said resilient rings at the inner peripheries thereof to said hub part, means clamping said resilient rings at the outer peripheries thereof to said rigid ring coupling part and reinforcing inlays imbedded in said resilient rings for transmitting torque between said inner and outer peripheries, the improvement comprising a resiliently deformable annular element which extends axially across, but does not fill, said cavity, said resiliently deformable annular element supporting said outwardly bulging parts of said resilient rings against each other.

4,249,395

HOMOKINETIC UNIVERSAL JOINT ASSEMBLY

Werner Krude, Neunkirchen, and Peter Harz, Hennef, both of Fed. Rep. of Germany, assignors to Uni-Cardan Aktiengesellschaft, Lohmar, Fed. Rep. of Germany

Filed Aug. 23, 1978, Ser. No. 935,875

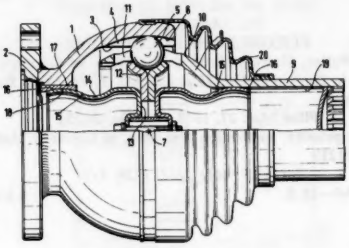
Claims priority, application Fed. Rep. of Germany, Sep. 21, 1977, 2742384

Int. Cl.³ F16D *3/30*

U.S. Cl. 64—21 **7 Claims**

1. A homokinetic universal joint assembly having a joint center and defining a bisecting plane comprising: an outer joint member; an inner joint member; said outer joint member and said inner joint member being arranged for axial mobility relative to each other to form said joint assembly as a sliding joint; roller bodies having a generally spherical configuration engaged between said inner and outer joint members for transmitting torque therebetween; a guide member located centrally

of said joint assembly within said inner joint member supporting said roller bodies in said bisecting plane; a control sleeve defining a mounting groove extending through said joint center with said guide member being supported within said mounting groove for movement in a direction radially of said joint assembly; means on said control sleeve defining spherical surfaces located on opposite sides of said joint center and spaced a generally equivalent distance therefrom, said spherical surfaces being engaged to guide said control sleeve within



said inner and outer joint members; and means defining recesses in said inner joint member for receiving therein in torque transmitting engagement said roller bodies, said recesses having a width taken in the circumferential direction of said joint generally corresponding to the diameter of said roller bodies and a length taken in the axial direction of said joint which is greater than the diameter of said roller bodies by an amount to permit sliding movement of said roller bodies relative to said inner joint member.

4,249,396

FLEXIBLE COUPLING

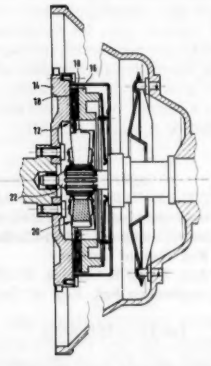
Günther Ziegler, Waldkraiburg, Fed. Rep. of Germany, assignor to SGF - Süddeutsche Gelenkscheibenfabrik GmbH & Co. KG, Fed. Rep. of Germany

Filed Oct. 13, 1978, Ser. No. 951,277

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1977, 2746127

Int. Cl.[3] F16D *3/14*

U.S. Cl. 64—27 NM **6 Claims**



1. A flexible coupling comprising:

(a) two rigid coupling parts rotatable relative to each other about a central axis;

(b) at least two entrainment means on each coupling part;

(c) at least two sets of elastomeric bodies comprising at least first and second sectorial elastomeric bodies, each said set being disposed, respectively, in series between each entrainment means of one coupling part and one adjacent entrainment means of the other coupling part;

(d) at least two annular discs spaced axially apart and supported on one of said coupling parts so as to be rotatable with respect to both coupling parts;

(e) at least two baffles, each said baffle positioned between said first and second sectorial elastomeric bodies of each said set;

(f) said baffles comprising planar baffle plates, the plane thereof containing said central axis, said planar baffle plates being arranged between and secured to said two annular discs; and

(g) said first and second elastomeric bodies of each set being vulcanized to the planar baffle plate arranged between them.

4,249,397

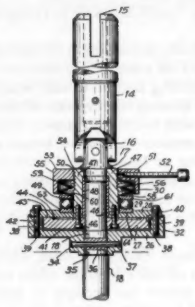
CLUTCH CONSTRUCTION FOR CAPPING MACHINE QUILL ASSEMBLY

Frank J. Guerra, East Islip, N.Y., assignor to Resina Automatic Machinery Co. Inc., Brooklyn, N.Y.

Filed May 21, 1979, Ser. No. 41,015

Int. Cl.[3] F16D *7/00*

U.S. Cl. 64—29 **2 Claims**



1. In a capping machine quill assembly, including a relatively fixed housing having a throughbore, a drive shaft element positioned within said bore, a lower end of which mounts a friction wheel, and an upper end connected to a source of rotational motion, improved clutch means for preventing the transmission of torque above predetermined limits through said friction wheel, comprising: a first shaft member, a radially extending clutch plate mounted upon said first shaft member at one end thereof; a second shaft member, a radially extending clutch cup member having an arcuate contact surface solely at the periphery thereof, and mounted upon said second shaft member at an end thereof abutting said first mentioned end and defining a recess; said clutch plate being disposed within and substantially filling said recess; a radially extending thrust plate overlying said recess and secured at the periphery thereof to a peripheral surface of said cup member for limited axial movement relative thereto; a thrust bearing secured to said first shaft member and contacting an exposed surface of said thrust plate, and resilient tension means surrounding said first shaft member and pressing said thrust bearing against said thrust plate to bring it into contact with said clutch plate, whereby motion is transmitted from said first shaft member to said second shaft member when the static friction existing between said thrust plate and said clutch plate is not overcome.

4,249,398

METHOD AND APPARATUS FOR PROCESSING HEAT-SOFTENABLE FIBER FORMING MATERIAL

Neil E. Greene, Granville, and Seshadri Srinivasan, Pickerington, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Feb. 16, 1979, Ser. No. 12,521
Int. Cl.[3] C03B 37/02
U.S. Cl. 65—1 19 Claims

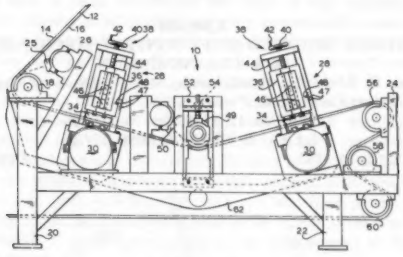
1. A bushing block in combination with a glass fiber forming bushing comprising a wall defining a passage for accommodating flow of heat-softened mineral material from a supply into the bushing and insulating means comprising an insulating space surrounding the wall, a radiation shield surrounding the insulating space and insulating material surrounding the radiation shield.

4,249,399

FABRIC WASHING SYSTEM

Joseph A. Bolton, Glens Falls, and Olavi A. Huhtala, Scotia, both of N.Y., assignors to Albany International Corp., Menands, N.Y.

Continuation-in-part of Ser. No. 29,540, Apr. 12, 1979. This application Dec. 10, 1979, Ser. No. 102,151
Int. Cl.[3] D06B 1/02, 15/00
U.S. Cl. 68—20 14 Claims



1. A system for cleaning and drying porous fabrics, comprising:

means for passing a porous fabric having a face side and a back side in a downstream direction and at an appropriate speed;

means for applying a liquid to said fabric;

means for applying suction to one side of said fabric positioned downstream from said means for applying liquid;

backup means positioned opposite said means for applying suction such that said fabric will pass in a gap between said backup means and said means for applying suction, said backup means preventing air from flowing directly through said fabric and causing it to flow along an indirect route; and

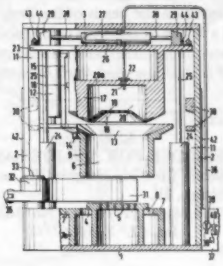
means for mounting said backup means opposite said means for applying suction, said mounting means including means for allowing said backup means to float upon a fabric as it passes thereunder, said backup means being at least capable of movement in a direction opposite said means for applying suction as it floats upon said fabric to increase the size of the gap.

4,249,400

WATER-EXTRACTION PRESS

Hans F. Arendt, Bleichinsel, D-7120 Bietigheim, Fed. Rep. of Germany

Filed Nov. 26, 1979, Ser. No. 97,392
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1978, 2852923
Int. Cl.[3] D06F 47/06
U.S. Cl. 68—242 19 Claims



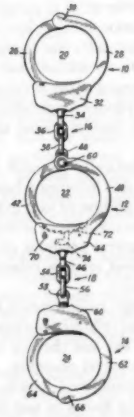
1. A press for extracting water from wet washing, the press comprising a housing, a perforated press floor for supporting a batch of wet washing, a charging frame for surrounding the batch of wet washing supported by the perforated press floor, a hydraulic ram for pressing the wet washing down against the press floor, the hydraulic ram comprising a generally bell-shaped diaphragm carrier whose open end is closed by a diaphragm and whose hollow interior is pressurizable with hydraulic fluid, and means for moving the charging frame together with the diaphragm carrier as a unit towards the press floor.

4,249,401

MULTIPLE HANDCUFF ARRANGEMENT

Joseph Daleo, Deer Park, N.Y., assignor to Triple Cuff Corporation, Melville, N.Y.

Filed Jan. 8, 1979, Ser. No. 1,721
Int. Cl.[3] E05B 75/00
U.S. Cl. 70—16 3 Claims



1. Apparatus comprising three handcuffs of at least substantially equal size, and flexible means connecting the handcuffs in series, said flexible means being chains, said handcuffs each including first and second cuff parts and pivot means coupling

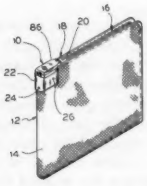
said cuff parts together, said cuff parts respectively forming respective halves of a circle, said second part being adapted for engaging said first part, the chains each including at least two interengaged links, eyes on said handcuffs engaging said links, each of said handcuffs including a head part generally diametrally opposed to the associated pivot means and connected to the associated second cuff part, one of said chains connecting a first of the handcuffs to a second of the handcuffs, another of the chains connecting the second of the handcuffs to a third of the handcuffs, a first, second and third of said eyes being respectively mounted on the heads of the first, second and third handcuffs, and a fourth of said eyes being mounted on the pivot means of said second handcuff, said chains connecting said first and fourth and said second and third eyes together.

4,249,402

KEEPER LOCK FOR A SLIDE FASTENER

Robert L. Steinbach, Glendale Heights, Ill., assignor to Chicago Lock Co., Chicago, Ill.

Filed May 7, 1979, Ser. No. 36,523
Int. Cl.³ E05B *67/38*
U.S. Cl. 70—68 **11 Claims**



1. In a keeper lock for a zipper-type slide fastener, said lock including a barrel assembly of a tubular barrel and an anvil fixed to and projecting radially from the barrel, a plug assembly of a lock cylinder rotatably received in said barrel and a keeper arm fixed to and projecting radially from the cylinder adjacent to a proximal end thereof, said plug assembly being rotatable relative to said barrel assembly about the longitudinal axis of said cylinder between a first position wherein said keeper arm overlies said anvil to secure a fastener member therebetween and a second position wherein said keeper arm is angularly offset from the anvil to permit access to the fastener member for manipulation thereof, and tumbler means carried by said cylinder and movable into engagement with said barrel to prevent said relative rotation, said tumbler means being movable out of said engagement in response to movement of a key inserted in said cylinder longitudinally from said proximal end and engaging the tumbler means, the improvement which comprises:

a locking bar reciprocally movable in said barrel rectilinearly along said axis between a base portion of the barrel and a distal end portion of said cylinder,

said base portion having means for engaging said locking bar in each of the several positions of the locking bar along said axis to prevent relative rotation between the barrel and the locking bar,

said distal end portion having means for engaging said locking bar to prevent relative rotation between the cylinder and the locking bar and thereby also between the plug assembly and the barrel assembly,

means resiliently biasing said locking bar into engagement with said engaging means of said distal end portion, and

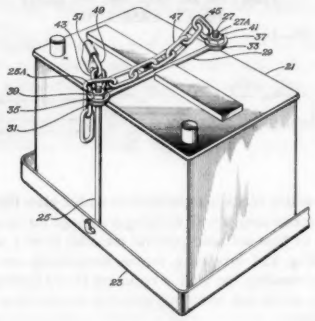
means engageable by a key which also engages said tumbler means for the latter movement thereof, for moving said locking bar out of its latter engagement in response to movement of the key, thereby to free the plug assembly for said rotation thereof relative to the barrel assembly.

4,249,403

BATTERY LOCKING MEANS

Calvin Littlejohn, 901 E. Harvey Ave., Fort Worth, Tex. 76104

Filed Jul. 25, 1979, Ser. No. 60,469
Int. Cl.³ E05B *73/00*
U.S. Cl. 70—230 **2 Claims**



1. A battery locking means, comprising:

two nuts adapted to be threaded to the top ends of two battery hold down posts respectively located on opposite sides of the battery,

one of said nuts having a single chain link attached thereto,

the other of said nuts having attached thereto a chain link of a length of chain,

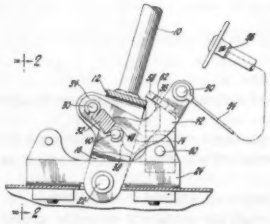
said length of chain being sufficient to extend over said battery to allow one of its links to fit around said single link of chain whereby the shackle of a padlock may be inserted through said single link of chain to prevent removal of the battery.

4,249,404

FLOOR MOUNTED SHIFT CONTROL MECHANISM FOR A TRANSMISSION

Dan R. Kimberlin, Frankenmuth, Mich., assignor to General Motors Corporation, Detroit, Mich.

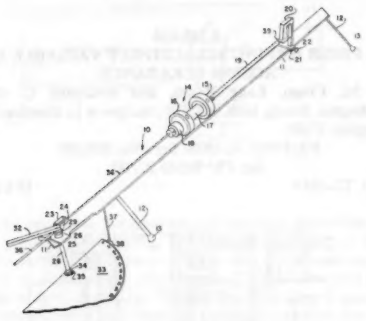
Filed Feb. 12, 1979, Ser. No. 11,395
Int. Cl.³ B60R *25/06*; E05B *65/12*
U.S. Cl. 70—248 **2 Claims**



1. A floor mounted transmission shift control and lock mechanism for a vehicle having a steering column with a lock comprising; bracket means secured to the vehicle, a shift control lever pivotally mounted on said bracket means, a lock lever pivotally mounted on said bracket means and operatively connected to the lock on the steering column to be held stationary thereby when the column is locked, a spring means for interconnecting said levers such that said levers will normally move in unison when the steering column is unlocked and the spring means permitting movement of said shift control lever relative to said lock lever when the steering column is locked, and a lock pawl means pivotally connected to said shift control lever having a cam surface engageable with an abutment on

said lock lever such that pivotal movement of said shift control lever relative to said lock lever when the steering column is locked will actuate in said lock pawl to engage said bracket means to prevent further pivotal movement of the shift control lever relative to said bracket means.

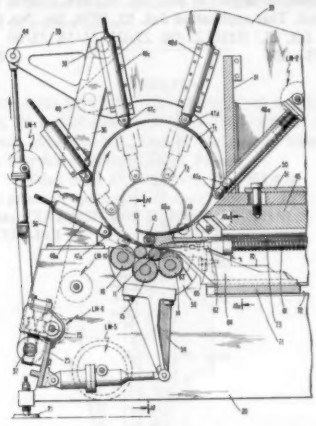
4,249,405
WIRE OR CABLE BENDING APPARATUS
Robert Cyr, 9750 Transit Rd., East Amherst, N.Y. 14051
Filed Apr. 12, 1979, Ser. No. 29,197
Int. Cl.[3] B21D *7/024*
U.S. Cl. 72—34 **3 Claims**



1. A manually operated wire or cable bending apparatus comprising a V-shaped support for supporting a pair of weighted members within said V-shaped support, one of said weighted members having a chuck mounted thereon for securing a wire or cable thereto and the other of said weighted members having an adjustable measuring tape swivelly secured thereto, a fixed bushing mounted on said V-shaped support, a grooved bending die fixedly mounted on said V-shaped support a rotatable handle having a shaft secured thereto with said shaft extending through said bending die and said bushing and terminating below said support, a forming block mounted off-center at one end of said handle, a wire or cable extending between said grooved die and said forming block, a compass card with graduations thereon frictionally secured to the lower end of said shaft, said forming block and said fixed grooved bending die adapted to impart a bend in the wire or cable when said handle is rotated counter-clockwise with respect to the said support.

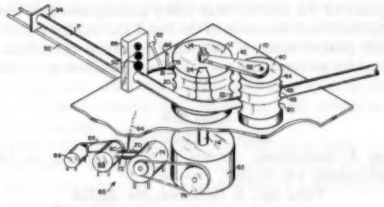
4,249,406
LINE PIPE FORMING APPARATUS AND METHOD
Frohman C. Anderson, 3435 Sharps Lot Rd., Swansea, Mass. 02777
Filed Sep. 5, 1978, Ser. No. 939,700
Int. Cl.[3] B21C *37/06*; B21D *39/02*
U.S. Cl. 72—52 **40 Claims**

1. Apparatus for forming a substantially closed elongated tubular article without the use of an internal mandrel or dies from a flat metal blank comprising inner and outer forming elements, means for mounting said elements relative to each other so as to provide a bend in said blank when the blank is passed therebetween, means to move said blank between said elements to progressively bend said blank along a substantially curved arc to form the tube, said mounting means including cantilever support means for mounting said inner forming element adjacent the end thereof, said inner forming element being positioned adjacent the point of forming of said bend, and means to compressively deflect said tubular article into a spiral within the limit of elastic recovery by guiding a leading edge of said article over said inner element, whereby upon



release of said article by said deflection means full formation of a closed cross section in said tube is assured.

4,249,407
APPARATUS FOR BENDING STEEL TUBES
Boyd C. Fogleman, 2170 Herron Rd., Whitsett, N.C. 27377
Filed Apr. 2, 1979, Ser. No. 26,353
Int. Cl.[3] B21D *7/024*
U.S. Cl. 72—217 **7 Claims**



1. Apparatus for bending steel tubes comprising:

(a) a non-rotatable die means mounted on a rotatable, vertically oriented shaft, said die means having at least one arcuate peripheral portion curved along a prescribed bending radius, said arcuate portion further including a recess therealong, the effective diameter of said recess being substantially equal to the outer diameter of the tube being bent;

(b) a rotatable force transmitting member secured to and extending radially from said shaft beyond the periphery of said die means a distance greater than the diameter of said tube and having a side surface positioned in confronting relationship to the recessed peripheral portion of said die means;

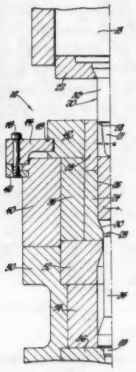
(c) means for selectively rotating said shaft and said force transmitting member relative to the periphery of said die means whereby a tube is caused to assume a bend having said bending radius; and

(d) hold-back means associated with said die means for preventing relative slippage between said tube and said die means, whereby a tube being bent is prevented from slipping relative to the peripheral surface of the die.

4,249,408
PROCESS FOR EXTRUDING MARAGING STEEL

Robert Lovell, 224 Burning Tree Dr., Naples, Fla. 39940

Continuation-in-part of Ser. No. 747,494, Dec. 6, 1976, abandoned. This application Jul. 12, 1978, Ser. No. 923,798
Int. Cl.[3] B21C *23/00, 23/03, 23/18, 25/00*
U.S. Cl. 72—256 20 Claims

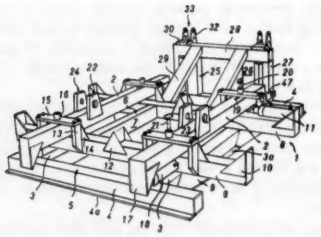


1. A method of cold extruding annealed maraging steel containing at least about 18% nickel to form an article of manufacture comprising the steps of providing a blank of maraging steel and performing a series of cold extrusion operations on the blank with a punch having an elongated nose tapered over its entire length and terminating in a rounded end to produce a combination forward extrusion and backward extrusion of the blank to form a tapered hole in the blank on the first cold extrusion operation and to also elongate the blank and to thereafter progressively elongate the blank and the tapered hole during subsequent cold extrusion operations, elongation of the tapered hole being accomplished at least in part by backward extrusion of the blank around the punch and wherein at least some of said cold extrusion operations are followed by an annealing cycle and a lubrication procedure.

4,249,409
BENCH ALIGNER

Mökjas J. Samuelsson, Orebro, Sweden, assignor to Josam Lastbilteknik AB, Orebro, Sweden

Filed Apr. 9, 1979, Ser. No. 28,224
Claims priority, application Sweden, Apr. 12, 1978, 7804107
Int. Cl.[3] B21D *1/12*
U.S. Cl. 72—305 16 Claims

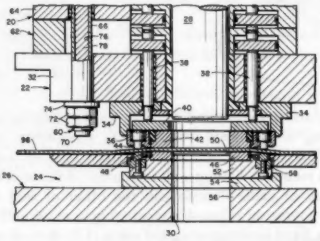


1. A straightening jig for vehicle bodies, said straightening jig comprising a stand for fastening to a foundation, and being equipped with a number of bearing fixings in which a number of bearing components on a vehicle body to be straightened may be fixed when said vehicle body is in position on said straightening jig, the improvement wherein (1) said stand is provided with guideways for at least one alignment bar arranged displaceably in said straightening jig and having extension in the longitudinal direction of said straightening jig, and (2) said alignment bar is provided with at least one bearing fixing in which a bearing component on said vehicle body may be fitted when said vehicle body is placed in said straightening jig, said alignment bar being arranged so that it can carry out displacement movements in said guideways both in the logitudinal direction of said alignment bar and in its transverse direction, preferably with the aid of servocontrolled operating devices, and wherein the relative position of said alignment bar in said stand can be locationally fixed when said alignment bar is moved into a given position for said bearing components of said vehicle body in position in said straightening jig.

4,249,410
DIE PRESS HAVING SELECTIVELY VARIABLE DIE ACCESS CLEARANCE

Terril M. Crago, Long Beach, and Frederick C. Olsen, Huntington Beach, both of Calif., assignors to Standun, Inc., Compton, Calif.

Filed Nov. 6, 1978, Ser. No. 958,006
Int. Cl.[3] B21D *22/00*
U.S. Cl. 72—347 15 Claims



1. In a press of the type having at least one longitudinally reciprocal ram mechanism including a first die assembly therein movable by movement of said ram mechanism longitudinally toward and away from a press second die assembly in a normal working operation, said first die assembly of said ram mechanism in a normal fully withdrawn position away from said press second die assembly having a predetermined normal longitudinal clearance from said second die assembly; the improvements comprising: at least one generally longitudinal fastening bolt normally under longitudinal tension compressively securing said first die assembly in said ram mechanism movable therewith, said fastening bolt being constructed and arranged having longitudinal stretching means operably associated therewith normally inactive and selectively actionable without otherwise effecting adjustment of said fastening bolt for temporarily longitudinally stretching said fastening bolt to relieve longitudinal compression of certain parts of said ram mechanism normally retained in compression by said fastening bolt; a selectively removable longitudinal spacer member in said ram mechanism normally subject to said fastening bolt longitudinal tension and normally retained thereby under compression, said spacer member being constructed and arranged assembled in said ram mechanism for selective displacement from assembly in said ram mechanism upon said fastening bolt being temporarily stretched by said stretching means relieving said compression and permitting said ram mechanism to be longitudinally shortened increasing said first die assembly normal clearance from said second die assembly, replacement of said spacer member into said assembly in said ram mechanism with return of said fastening bolt stretching means to normally inactive restoring said ram mechanism to exact normal form including said fastening means compression and said first die assembly normal clearance with said second die assem-

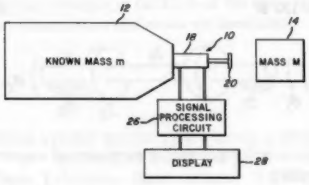
bly; moving means associated with said ram mechanism for longitudinally shortening and lengthening said ram mechanism during said displacement of said spacer member from said assembly in said ram mechanism.

4,249,411

ZERO-G MASSMETER

Jerome Pearson, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 31, 1979, Ser. No. 43,983
Int. Cl.³ G01N *9/00*
U.S. Cl. 73—12 **5 Claims**



1. An apparatus for determining the mass of an object in a zero gravity environment, comprising: an object of known mass; a spring system constrained at one end by said object of known mass; an impact plate attached to the other end of said spring system; means for limiting the direction of motion of said impact plate to a direction along the axis of the spring system; means, positioned adjacent to said spring system for producing a signal t proportional to the duration of impact of said object of unknown mass with said impact plate; means, responsive to said signal for providing an output signal proportional to

$$\frac{kt^2}{\pi^2 - \frac{k}{m}t^2},$$

where k is the spring constant and m is the mass of the object of known mass.

4,249,412

FLUORESCENT LEAK DETECTION COMPOSITION

Claude A. Townsend, III, 5611 Havenhill Rd., Birmingham, Ala. 35210

Filed Dec. 11, 1978, Ser. No. 968,650
Int. Cl.³ G01M *3/04*; C09K *11/02*
U.S. Cl. 73—40.7 **8 Claims**

1. A method of detecting a leak in a container comprising applying a thick coating to the exterior surface of the container of an aqueous fluorescent leak detection composition comprising water, a nonionic surfactant having an HLB value of about 12 to about 14 in an amount effective to promote wetting and bubbling of the composition for a time sufficient to detect a leak in the container, about 0.025 to about 1.0 weight percent sodium fluorescein, a semisynthetic cellulose thickening agent in an amount effective to provide the composition with a viscosity of about 75 to about 125 cps at 20° C., and an antifreeze agent in an amount effective to retard freezing of the composition for a sufficient time to detect a leak when the composition is applied to a cold surface, and detecting bubbling of the composition in the presence of a leak.

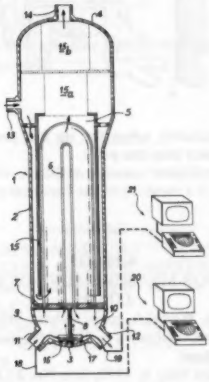
2. An aqueous fluorescent leak detection composition comprising water, a nonionic surfactant having an HLB value of about 12 to about 14 in an amount effective to promote wetting and bubbling of the composition for a time sufficient to detect a leak in a container when the composition is applied to the surface thereof, about 0.025 to about 1.0 weight percent sodium fluorescein, a semisynthetic cellulose thickening agent in an amount effective to provide the composition with a viscosity of about 75 to about 125 cps at 20° C., and an antifreeze agent in an amount effective to retard freezing of the composition for a sufficient time to detect a leak when the composition is applied to a cold surface.

4,249,413

METHOD AND DEVICE FOR LOCATING A DEFECTIVE TUBE IN A STEAM GENERATOR TUBE BUNDLE

Jean Denis, Mesnil-le-Roi, France, assignor to Electricite De France (Service National), Paris, France

Filed Nov. 20, 1978, Ser. No. 962,474
Claims priority, application France, Nov. 22, 1977, 77 35037
Int. Cl.² F28D *7/06*; G01N *21/32*; G01M *3/18*
U.S. Cl. 73—49.1 **9 Claims**



1. In a method for identifying a defective tube which has been located in a steam generator, said steam generator including a shell, a plurality of heat exchanging tubes disposed within said shell and provided with extremities, a tube plate disposed within said shell in which said extremities are fixed, and a bottom end wall which with said tube plate defines an internal space, the improvement for identifying said defective tube which comprises:

sweeping the entire tube plate by means of at least one camera placed within said internal space in order to visualize said entire tube plate on a screen which is external to said steam generator, and

independently projecting a luminous mark onto said tube plate at a point for its identification, said point corresponding to said extremity of said defective tube, said projecting being in a manner such that said luminous mark appears on said screen during said sweeping with said camera.

4,249,414

APPARATUS FOR TESTING HARDNESS OF WOODEN POLES

Leonard A. Barth, Pte. Claire, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Dec. 10, 1979, Ser. No. 102,243
Int. Cl.³ G01N *3/42*
U.S. Cl. 73—81 **7 Claims**

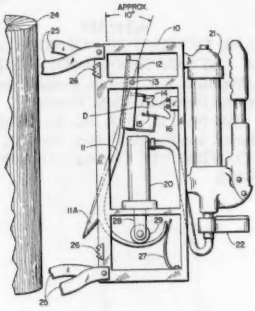
1. A hardness tester for wooden poles and the like comprising:

a frame removably mountable on the side of a wooden pole;

a gaff slidably mounted on the frame with separate means so that its longitudinal direction of movement freely alterable relative to the longitudinal axis of the pole;

means for urging the tip of the gaff against the side of the

pole so that the initial longitudinal direction of movement is at a preset angle relative to the axis of the pole;
a hydraulic pump for applying a substantially steadily increasing pressure to the gaff to wedge the tip into the pole;
a manometer for indicating the hydraulic pressure from the pump; and



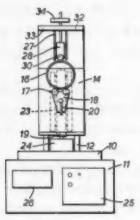
means for indicating when the tip has penetrated a preselected distance into the pole;
whereby the indicated pressure at the preselected distance of penetration is a measure of the hardness of the outer wood of the pole.

4,249,415

APPARATUS FOR MEASUREMENT OF COMPRESSIVE LOADS

Gordon H. Steel, Warwick, and Graham Mitchell, Nuneaton, both of England, assignors to Brico Engineering, Co., Ltd., Coventry, England

Filed May 8, 1979, Ser. No. 37,177
Claims priority, application United Kingdom, May 26, 1978, 23360/78
Int. Cl.[3] G01M *15/00*
U.S. Cl. 73—120 **4 Claims**



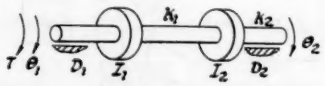
1. Apparatus for measuring the diametral load to close of a piston ring, comprising
a frame,
a first slideway mounted on the frame and defining a predetermined direction of sliding,
anti-friction bearing means on the first slideway,
a first slide mounted on the anti-friction bearing means of the first slideway,
load cell means mounted on the frame,
means to transmit the load on said first slide to the load cell means,
a second slideway mounted on the frame and defining a direction of sliding parallel to the said predetermined direction,
a second slide mounted in said second slideway,
mounting means carried by said first and second slides for contacting, locating and holding positions on the piston ring which are substantially opposed to each other at opposite ends of a diameter of the ring which is perpendicular to the diameter passing through the gap of the ring,
means to apply a compressive load to the two positions on the piston ring through the second slide so as to tend to close the gap of the ring, and
means connected to the load cell to provide a measurement of the compressive load applied to the piston ring.

4,249,416

APPARATUS FOR MEASURING ENGINE TORQUE

Allan J. Kotwicki, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 25, 1979, Ser. No. 51,355
Int. Cl.[3] G01L *3/00*
U.S. Cl. 73—133 R **4 Claims**



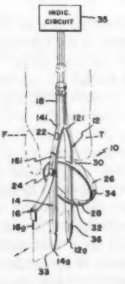
1. An apparatus for generating an electrical engine torque signal comprising
angle encoder means responsive to rotation of both the rear and the front ends of the engine crankshaft for producing first and second electrical digital rotation signals,
a phase-locked-loop circuit responsive to each of the rotation signals for producing first and second instantaneous velocity signals,
a phase comparator having the first and second rotation signals as inputs for producing an output signal representing crankshaft twist,
circuit means responsive to the first and second velocity signals to generate corresponding first and second acceleration signals,
and means for scaling and combining the velocity, twist and acceleration signals to produce an output signal representing engine torque.

4,249,417

MULTIFUNCTIONAL TRANSDUCER

Alan M. Lovelace, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Cyril Feldstein, Sierra Madre, Calif.; Gilbert W. Lewis, Arcadia, Calif.; Virgil H. Culler, La Canada, Calif., and Samuel Merrbaum, Woodland Hills, Calif.

Filed Jun. 1, 1979, Ser. No. 44,432
Int. Cl.[3] G01L *5/00*
U.S. Cl. 73—141 A **2 Claims**



2. A transducer for measuring stress and strain near the surface of an object, comprising:
three legs having free outer ends and connected inner ends, said leg outer ends having means for fixing them in posi-

tion with respect to the object so the legs move in response to movement of the object locations to which they are fixed;

first sensor means for measuring relative movement of a first pair of said legs;

second sensor means for measuring relative movement of a second pair of said legs;

said first pair of legs being stiff against movement of their outer ends, and one of said legs of said second pair being highly compliant to movement of its outer ends; and

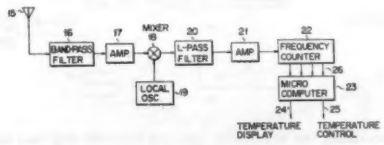
a thickness measuring device including a compliant loop having a first portion fixed to one of said legs and a second free portion which can move relative to said leg, and sensing means for measuring bending of the loop, whereby to measure changes in thickness at the same region of the object where stress and strain are measured.

4,249,418

TEMPERATURE DETECTOR USING A SURFACE ACOUSTIC WAVE DEVICE

Yasuo Ebata, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 12, 1979, Ser. No. 29,530
Claims priority, application Japan, Apr. 20, 1978, 53-46848
Int. Cl.³ G01K *11/24*
U.S. Cl. 73—339 A **6 Claims**



1. A temperature detector using a surface acoustic wave device comprising:

a transmitting section including an oscillator having a surface acoustic wave device of which the frequency characteristic varies responding to the temperature of a base plate thereof, said base plate being attached to a member having good heat conductivity through a flexible adhesive layer, said oscillator generating an oscillating output of a frequency corresponding to said frequency characteristic of said surface acoustic wave device, and a first antenna coupled to said oscillator for transmitting said oscillating output; and

a receiving section including a second antenna for receiving the output of said first antenna, a means for detecting the oscillation frequency of said oscillator from the output of said second antenna, and a signal processing circuit for processing the output of said detecting means.

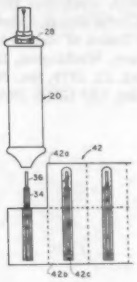
4,249,419

MICROPIPETTE SYSTEM

Bradley S. Thomas, 2316 Harcroft Rd., Timonium, Md. 21093

Filed Jan. 5, 1979, Ser. No. 1,394
Int. Cl.³ B01L *3/02*
U.S. Cl. 73—425.6 **19 Claims**

1. In a system for micropipetting having a housing with plunger-reciprocating means for drawing in and dispensing fluid through disposable tip structure, the improvement comprising: the disposable tip structure including a barrel, a plunger within the barrel and means for simultaneously replacing the plunger and barrel together by one-hand operation; the means for simultaneously replacing including means for separately gripping the plunger and barrel and movable from a



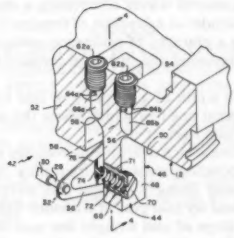
released condition to a gripping condition to grip the plunger and barrel simultaneously.

4,249,420

BEARING PRELOAD ASSEMBLY FOR USE IN AN OIL FILLED ACCELEROMETER

Richard D. Marquess, Concord, Calif., assignor to Systron-Donner Corporation, Concord, Calif.

Filed Aug. 9, 1979, Ser. No. 65,376
Int. Cl.³ G01P *15/02*
U.S. Cl. 73—516 R **9 Claims**



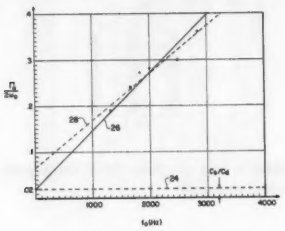
1. In an accelerometer including a sealed, oil filled housing, a pendulous member located within said housing, and a pair of bearing means for pivotally supporting said pendulous member, an assembly for preloading at least one of said bearing means comprising first means located entirely within said housing and movable therein for applying and adjusting a preload force against said one bearing means, whereby to preload the latter to a predetermined extent before said housing is assembled, filled with oil and sealed and second means for further adjusting said applied force and therefore the preloading of said one bearing means from outside said housing after the latter has been assembled, filled with oil and sealed, said second means including inner means located within said housing and movable in a predetermined way for further adjusting said applied force and said preload and outer means located outside said housing for moving said inner means in said predetermined way, said housing including an integrally formed section and said movable inner means being an inside member integrally formed with said housing section and located inside said housing when the latter is assembled.

4,249,421

METHOD TO DETERMINE THE SHEAR ABSORPTION OF A RUBBERLIKE MATERIAL

Guillermo C. Gaunaurd, Rockville; Herbert M. Überall, Bethesda, and Kurt P. Scharnhorst, Columbia, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 22, 1979, Ser. No. 87,269
Int. Cl.[3] G01N *29/00*
U.S. Cl. 73—589 4 Claims



1. A method for determining the shear absorption of a viscoelastic material comprising the steps of:

forming a cavity of known dimensions within a sample of said viscoelastic material, wherein said cavity is filled with a fluid having a known density and wavespeed;

directing incident acoustic waves containing a predetermined frequency spectrum at said viscoelastic material, thereby creating compressional waves in said material that impinge upon said cavity and create therein a set of modal resonances;

receiving a portion of said waves backscattered from said cavity;

converting said received waves into electrical signals;

obtaining from said electrical signals a spectral response of said backscattered waves comprising a modulus of resonance amplitudes as a function of frequency, said modulus comprising a plurality of resonance peaks corresponding to the fundamental and overtone resonances of said cavity;

measuring the width of a plurality of said resonance overtones at a point one half-width below the maximum value of each of said overtones;

plotting said resonance overtone half-widths as a function of the corresponding resonance frequency of each of said overtones and fitting a straight line through a locus of points defined by said plot of overtone half-widths; and

deriving the slope of said straight line and obtaining therefrom the shear absorption of said viscoelastic material, wherein said shear absorption is proportional to the slope of said line, the density and wavespeed of said viscoelastic material, and the density and wavespeed of said fluid within said cavity.

4,249,422

APPARATUS AND PROCESS FOR DETERMINING THE COMPOSITION OF FLUID-FILLED CAVITIES

Guillermo C. Gaunaurd, Rockville, and Herbert M. Überall, Bethesda, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 22, 1979, Ser. No. 87,270
Int. Cl.[3] G01N *29/00*
U.S. Cl. 73—589 7 Claims

1. A method for determining the properties of a fluid encapsulated in a cavity within a viscoelastic material comprising the steps of:

directing an incident wave formed of a series of acoustic pulses having a known frequency spectrum at said viscoelastic material, thereby creating compressional waves in said material that impinge upon said fluid-filled cavity and create therein a set of modal resonances;

receiving a portion of said waves backscattered from said cavity;

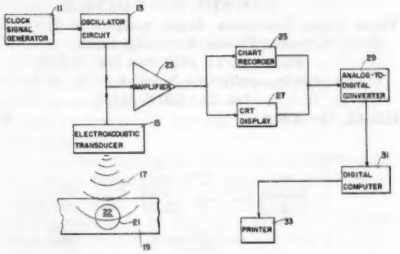
converting said received waves into electrical signals;

converting said electrical signals into an echo pattern of said backscattered waves comprising a composite modulus of resonance amplitudes as a function of frequency;

subdividing said echo pattern into its component partial-wave resonance responses, each of which corresponds to a particular resonance mode;

determining the background components of said partial-wave responses, said background components being proportional to the resonance response of a cavity having zero density;

subtracting said background component from a partial-wave response of the same mode, thereby obtaining a spectral response comprising a plurality of resonance peaks corresponding to the fundamental and overtone modal resonances of said partial-wave responses;



measuring the asymptotic spacing between any two consecutive, high-order modal resonance overtones and obtaining therefrom, for a viscoelastic material having a known wavespeed, the wavespeed of said unknown fluid, said spacing being proportional to the ratio of said unknown fluid wavespeed to said known viscoelastic material wavespeed; and

determining the width of any of said high-order modal resonance overtones at a point one half-width below the maximum value of said overtone and obtaining therefrom, for a viscoelastic material having a known density, the density of said unknown fluid wherein the ratio of said unknown fluid density to said known viscoelastic material density is proportional to said width, said asymptotic spacing, said partial-wave mode, and said particular high-order modal resonance overtone whose width is being determined, whereby the properties of said unknown fluid in said cavity are defined by said fluid density and the wavespeed within said fluid.

4,249,423

SEMI-NONDESTRUCTIVE RESIDUAL STRESS MEASUREMENT

John R. M. Viertl, Schenectady, and Marshall G. Jones, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

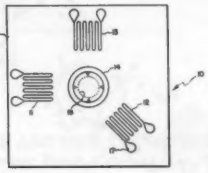
Filed May 11, 1979, Ser. No. 38,069
Int. Cl.[3] G01N *19/06*
U.S. Cl. 73—783 8 Claims

1. A semi-nondestructive method of making surface strain measurements on an object for determination of residual stresses comprising the steps of:

attaching a strain gage to the surface of the object being tested,

locally melting a region of the object in the immediate vicin-

ity of the strain gage with a finely directed heat source to thereby relieve the stresses, and



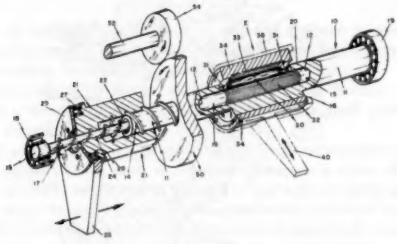
dynamically measuring the change in strain caused by stress relaxation while the region is molten and before heat diffuses under the strain gage and results in thermal stress that would alter the measurements.

4,249,424

VARIABLE THROW ECCENTRIC

William J. Glazier, 237 Harbour Ave., North Vancouver, British Colombia, Canada (V7J 2E8)

Filed Aug. 7, 1978, Ser. No. 931,411
Claims priority, application Canada, Nov. 23, 1977, 291545
Int. Cl.³ F16H *21/42, 29/04*
U.S. Cl. 74—25 **10 Claims**



1. A dynamically variable throw eccentric comprising:

(a) a main drive shaft having a first fixed eccentric member, the shaft extending at one end into an outer spiral thread, while defining a cylindrical recess that extends into the shaft;

(b) a sector defined by the shaft communicating with the recess, the shaft also defining a protuberance as a first eccentric member;

(c) a control shaft residing in the cylindrical recess and extending beyond said end as a spirally threaded shaft;

(d) a movable control sleeve having an inner surface defining a spirally threaded major bore stepping into a spirally threaded minor bore, the threaded major bore threadingly mating with the outer spiral thread of the main shaft and the minor bore threading mating with the spiral threaded control shaft whereby axial movement of the sleeve along the shafts changes, relatively, the angular position of the shafts;

(e) a second eccentric member mating with and mounted to travel relative to first eccentric member; and,

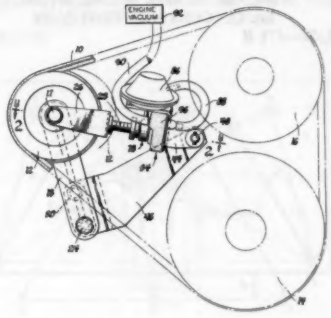
(f) means for communicating the relative angular position of the shafts through the sector and to responsively locate the relative angular positions of the eccentric members in response thereto irrespective of the angular velocity of the main drive shaft.

4,249,425

AUTOMATIC BELT TENSIONING MECHANISM

Richard D. Watson, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 29, 1979, Ser. No. 89,229
Int. Cl.³ F16H *7/10, 7/12*
U.S. Cl. 474—110 **5 Claims**



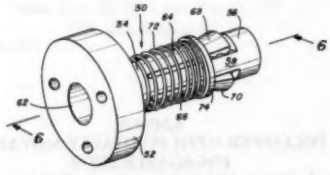
2. An automatic belt tensioner comprising; a pivotal support means for supporting a pulley about which a belt is trained; fixed support means for providing a relatively stationary position; and an adjusting mechanism operatively connected between said pivotal support means and said fixed support means including a pair of threaded means one of which moves longitudinally in response to rotation of the other to vary the distance between the support means and thereby adjust belt tension, one-way drive means and vacuum motor means operative to rotate the other of said threaded means and cooperating with said thread means to establish a predtermined tension in said belt, and a variable vacuum source operative to drive said vacuum motor.

4,249,426

ANTI-BACKLASH NUT HAVING LONGITUDINAL FLEXURAL MEMBERS WITH RAMPS THEREON AND MEANS TO APPLY AN AXIAL PRE-LOAD FORCE TO SAID RAMPS

Kenneth W. Erikson, Merrimack, and Keith W. Erikson, Nashua, both of N.H., assignors to Kerk Motion Products, Inc., Nashua, N.H.

Filed Jul. 17, 1978, Ser. No. 925,269
Int. Cl.³ F16H *55/18;* F16B *39/36*
U.S. Cl. 74—441 **10 Claims**



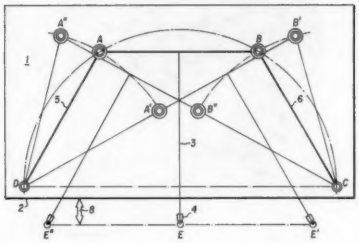
1. In an anti-backlash nut designed to move along a screw in either of two longitudinal directions, said nut including one or more longitudinal flexure members having one end fixed and one end free-floating:

the improvement comprising providing upwardly inclined ramps on the exterior of the free-floating ends of said longitudinal flexure members and means for applying an axial force to each of said ramps, said axial force being substantially constant in either direction of motion of said nut.

4,249,427
MANIPULATING ARRANGEMENT WITH MULTIPLE FUNCTIONS, PARTICULARLY FOR THE AIR-CONDITIONING OF VEHICLES

Andre Colinet, Puteaux; Christian Schwartz, Boulogne, and Jean-Pierre Francois, Velizy, all of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed May 19, 1978, Ser. No. 907,732
Int. Cl.[3] G05G 9/02; F16H 21/44
U.S. Cl. 74—471 R 9 Claims



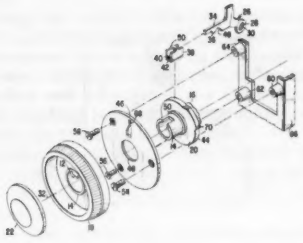
1. Manipulating arrangement with multiple function comprising a main lever able to indirectly pivot about at least one fixed axis integral with a support plate, the accessible end of which moves in an essentially parallel manner to the front of the said plate due to the transformation of motion realized by at least one intermediate link articulated on the main lever and acting at least indirectly on one of the air-conditioner controls, wherein said main lever **3** is in the general shape of a T, the ends of the horizontal arm of which articulate with two links **5, 6** mounted so as to pivot on the plate **1** about two fixed axes D, C, that the articulations A, B between the main lever and the links, as well as the pivot axes D, C of the said links, are situated at the vertices of an isosceles trapezoid ABCD formed when the main lever **3** is at the mid-position E of its travel so that the vertical arm of the T is perpendicular to the plane of the front **2** of the plate and by the fact that the said isosceles trapezoid is inscribed in a semi-circle of diameter corresponding to the distance between the pivot axes D, C of the links, the said diameter being parallel to the front **2**, wherein each of said two links entrains one of two secondary levers mounted so as to pivot about one of two fixed axes M, P integral with the plate by means of one of two rollers **11, 12** fixed to one of said secondary levers and adapted to move in at least one guide groove machined in each of said two links **5, 6**.

4,249,428
CAM FOLLOWER WITH PIVOTALLY MOVABLE CAM ENGAGABLE SHOE

William L. Herron, Elizabeth, and Charles R. Odermann, Montville, both of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Feb. 4, 1980, Ser. No. 118,281
Int. Cl.[3] F16H 53/06
U.S. Cl. 74—569 2 Claims

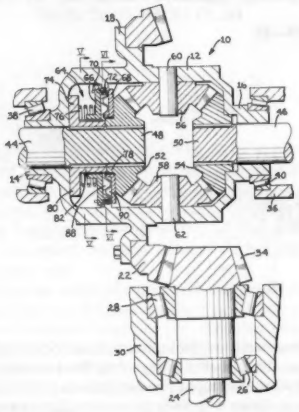
1. In combination, a rotatable cam with a peripheral camming surface, and a cam follower which is pivotally movable thereby about an axis substantially perpendicular to the axis of rotation of the rotatable cam, said cam follower including an arm with a projecting finger and a shoe on the arm in line contact with the rotatable cam across its peripheral surface, the shoe being pivotally movable on the finger about an axis perpendicular to the said line whereby line engagement is maintained between the shoe and said peripheral camming surface as the cam follower is moved by the rotatable cam.



4,249,429
UNLOCKING DIFFERENTIAL

Ralph E. Denning, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sep. 5, 1978, Ser. No. 939,751
Int. Cl.[3] F16H 1/44
U.S. Cl. 74—711 7 Claims



1. In a differential (**10**) having a housing (**12**) rotated by a drive shaft (**24**), a pair of axles (**44,46**) driven by the differential extending along the rotational axis of the housing and having respective inner ends (**48,50**) within the housing, differential gears (**56,58**) rotatably supported by the housing and drivingly connecting together the housing and the inner ends of the axles, a locking mechanism comprising:

a pair of axially opposed cams (**66,68**) carried by one of the axles (**44**) and rotating therewith, one of said cams (**66**) being axially movable between operative and inoperative positions;

means (**76**) biasing said one cam (**66**) toward operative position in meshed engagement with the other cam (**68**);

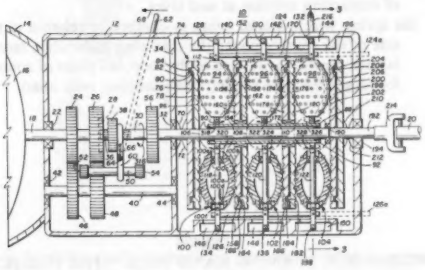
locking means (**98**) associated with said one cam (**66**) and engaging cooperating means (**96**) carried by the housing when said cams (**66,68**) are engaged, said one cam (**66**) providing rotational backlash between the housing and said one axle (**44**) so that interaction of said cams (**66,68**) during differential rotation of said cams (**66,68**) moves said one cam (**66**) axially out of engagement with the housing; and

lockout means (70) for maintaining said cams (66,68) in spaced disengaged relation during differential rotation of the axles (44,46).

4,249,430
ROLLER AND DISC TRANSMISSION

Joe E. Burkett, Burkett Route, Coleman, Tex. 76834

Filed Dec. 21, 1978, Ser. No. 971,722
Int. Cl.[3] F16H *3/02, 15/16, 13/10*
U.S. Cl. 74—745 10 Claims



1. A transmission which is connected between a power driven input shaft and an output shaft for producing selectable drive ratios therebetween, comprising in combination,

(a) a housing having the input shaft extending therein,

(b) a tubular support shaft having the input shaft passing therein,

(c) a plurality of similar ellipsoidal rollers spaced about said support shaft, each roller rotatable about a roller shaft pivotally connected at one end to said support shaft, each roller having a plurality of circumferential rows of teeth,

(d) a drive disc rotatably engaged to said input shaft, coaxial therewith, located within said housing, and contacting a set of said rollers, said drive disc having a plurality of concentric rows of holes in the surface thereof facing said rollers, each row of holes mating with one row of said teeth on said rollers whereby said rollers engage said drive disc with different ones of said rows of teeth when said rollers are tilted at predetermined angles relative to said support shaft,

(e) a driven disc rotatably engaged to the drive shaft, coaxial therewith and located within said housing in contact with predetermined ones of said rollers, said driven disc having a plurality of concentric rows of holes in the surface thereof facing said predetermined rollers, each row of holes mating with one said row of teeth on said predetermined rollers, whereby said predetermined rollers engage said driven disc with different ones of said rows of teeth when said rollers are tilted at predetermined angles to said support shaft,

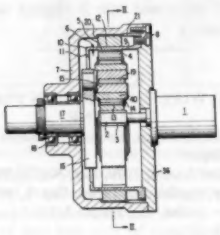
(f) means for tilting said rollers relative to the longitudinal axis of said support shaft to produce a plurality of drive ratios between the input shaft and the output shaft by engaging selected rows of said teeth on said rollers with the corresponding rows of said holes on said discs, and

(g) each of said discs comprises a first plate and a second plate rotatably engaged and tensioned apart by spring means with one of said plates having said row of holes therein.

4,249,431
PLANETARY SPEED REDUCER WITH DEFORMABLE RING

Francois D. Pruvot, Lausanne, and Yvonnick P. Chesnel, Guyancourt, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Mar. 3, 1978, Ser. No. 883,234
Claims priority, application France, Mar. 3, 1977, 7706236
Int. Cl.[3] F16H *3/44, 1/28, 57/00*
U.S. Cl. 74—785 14 Claims



1. A speed reducer mechanism which comprises:

an input shaft;

gear teeth disposed on said input shaft;

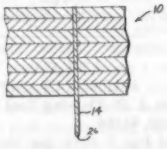
at least two and at most three planet gears disposed adjacent to and directly driven by said gear teeth; and

a radially deformable annulus including teeth, driven by said planet gears, with an axis concentric with the axis of the input shaft, the teeth of the annulus having a pitch circle diameter, measured at maximum and minimum points between the midpoint of the teeth of the annulus and the teeth roots, less than that of a circle, located from near the midpoint of the teeth to near the tip of the teeth, circumscribed about said planet gears in an operating position and engaging without play the gear teeth of the input shaft, the deformable annulus serving to urge the planet gears inwardly against the input shaft gear teeth to remove play in the reducer gear train, and the difference in diameter of the pitch circles of the teeth of the annulus and the planet gear ensuring that the meshing will be without play for the life of the speed reducer.

4,249,432
RULED SCORING DIE

Herman A. Graboyes, 425 Bercado Cir., Mishawaka, Ind. 46544, and Simon R. Miller, Jr., 2000 Middlebury St., Elkhart, Ind. 46514

Filed Aug. 30, 1979, Ser. No. 71,391
Int. Cl.[3] B21K *5/20*
U.S. Cl. 76—107 C 4 Claims



1. A method of constructing a die having a scoring rule and accommodating counter plate for use in a paper or similar soft material scoring operation comprising the steps:

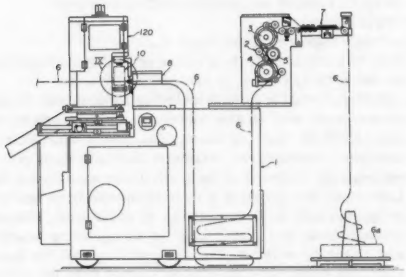
a. Forming a slot in said counter plate,
b. Providing a counter member having a transverse dimension less than the transverse dimension of said slot, said counter member having a channel formed therein to guidably accommodate said rule when scoring said material as such material is positioned between said rule and said counter member,
c. Locating said counter member within said counter plate slot with said rule in alignment with said channel of the counter member, and
d. Securing said counter member to said counter plate in the slot thereof while said rule is aligned with the counter member channel.

4,249,433

SHEATHED WIRE END PORTION PROCESSING MACHINE

Akinori Hara, Tokyo, Japan, assignor to Osawa Press Mfg. Co., Ltd., Tokyo, Japan

Filed Apr. 4, 1979, Ser. No. 26,786
Claims priority, application Japan, Sep. 7, 1978, 53-109893
Int. Cl.[3] H02G *1/12*
U.S. Cl. 81—9.51 **9 Claims**



1. A sheathed wire end portion processing machine comprising a forwarding device for forwarding the sheathed wire by the predetermined length, a cutting device with cutters arranged on the forwarding side of the forwarding device and strip cutters arranged on the both sides of and adjacent to the cutters respectively, a first clamping device arranged intermediate the forwarding device and the cutting device, a first moving device for moving the first clamping device away from the cutting device along the passage of the sheathed wire, a second clamping device arranged on the wire outlet side of the cutting device, a second moving device for moving the second clamping device away from the cutting device along the passage of the sheathed wire, and a third clamping device arranged on the wire inlet side of the forwarding device and operable to clamp the sheathed wire when the sheathed wire is forwarded by a predetermined length by the forwarding device and then the latter is stopped, while the first clamping device is operated to clamp the sheathed wire.

4,249,434

HACKLE CLAMP

Joseph Doiron, c/o J. D. Flytying Tool Co., 27544 Seco Cyn. Rd., Saugus, Calif. 91350

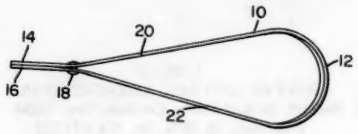
Filed Jun. 7, 1979, Ser. No. 46,458
Int. Cl.[3] B25B *9/02*
U.S. Cl. 81—43 **1 Claim**

1. A fly tyer's hackle clamp comprising a length of spring wire in the form of a simple loop having the ends thereof in close juxtaposition and flatly contacting each other in clamping relationship,

a rivet holding the wire in the form of a loop and also holding the clamping ends generally flatwise together in clamping relation,

said rivet being located inwardly of the terminal ends of the clamping ends,

the rivet having an unimpeded shank longer than the combined thicknesses of the two clamping ends and a head at



each end of the shank holding the spring wire material out of contacting relation at said rivet,

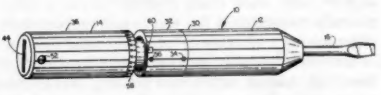
the spring wire material being in contacting relation at the side of the rivet opposite the clamping ends when lateral inward pressure is applied to the loop, the point of contact forming a fulcrum to force the clamping ends apart.

4,249,435

WORKPIECE TURNING HAND TOOL WITH TORQUE CONTROL

Norman R. Villeneuve, 84 Newgate Rd., East Granby, and William J. Smith, 17 Mildred Rd., West Hartford, both of Conn.

Filed Jul. 30, 1979, Ser. No. 61,856
Int. Cl.[3] B25B *23/142*
U.S. Cl. 81—477 **10 Claims**

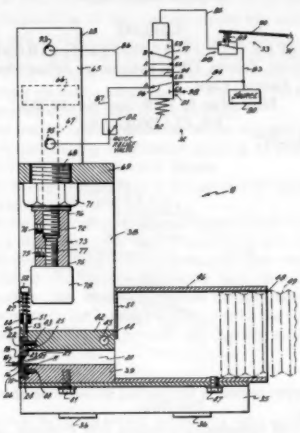


1. A hand tool for turning a screw, nut, bolt or other rotatable workpiece, said tool comprising a bottom housing having a workpiece engageable part, a handle located above said bottom housing, means connecting said handle to said bottom housing for angular and axial sliding movement of said handle relative to said housing, coengageable stops on said housing and on said handle for limiting the axial sliding movement of said handle relative to said housing to movement between an extended position and a retracted position, a torsion spring connected between said housing and said handle for angularly biasing said handle to a neutral angular position relative to said housing and for yieldingly resisting rotation of said handle relative to said housing in either direction away from said neutral position, and angular stop means on said housing and cooperable angular stop means on said handle, said angular stop means of said housing and said angular stop means of said handle being engageable with one another in any one of a plurality of angular positions of said handle relative to said housing when said handle is in one of said extended or retracted positions to prevent rotation of said handle relative to said housing, and said angular stop means of said housing and said angular stop means of said handle being out of engagement with one another when said handle is in the other of said extended or retracted positions to permit said handle to rotate relative to said housing.

4,249,436
MACHINE AND METHOD FOR REMOVING A LABEL SEWN TO A WORKPIECE

Bobby J. Clay, Cincinnati, Ohio, assignor to Natmar, Inc., Cincinnati, Ohio

Filed Oct. 10, 1979, Ser. No. 83,253
Int. Cl.³ B26D 1/38
U.S. Cl. 83—22 17 Claims



1. A label cut off machine for removing a label sewn to a workpiece, said machine comprising

a label chamber sized to receive said label therein through an access slot in one wall thereof,

a reciprocable cutter bar and an anvil, said cutter bar and anvil cooperating to define said access slot and at least a portion of said one wall of said label chamber, said cutter bar and said anvil presenting abutment faces which cooperate with said workpiece to allow positioning of said label's stitch line closely adjacent the cutting edge of said cutter bar when said label is inserted into said label chamber,

a cut off motor operably connected with said cutter bar, said cut off motor being selectively operable to drive said cutter bar into a cut off position with said anvil for cutting off said label from said workpiece when desired by an operator, and

a vacuum source connectable with said label chamber for establishing a vacuum in said label chamber, said vacuum source cooperating with said cutter bar and anvil to draw said label initially into said chamber through said access slot and to aid in locating said label's stitch line initially adjacent said cutter bar's cutting edge, and said vacuum source removing said label from said label chamber after cut off of said label from said workpiece.

4,249,437
AUTOMATIC MAT CUTTING MACHINE

Leo J. Hagenson, P.O. Box 33427, St. Paul, Minn. 55133

Filed Jun. 28, 1979, Ser. No. 52,905
Int. Cl.³ B26D 5/04
U.S. Cl. 83—39 7 Claims

1. A device for automatically and simultaneously making two parallel straight cuts of a predetermined length in a mat, said device comprising:

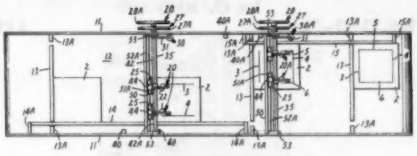
a transporting means;

a first pair of cutting means above said transporting means for simultaneously making two parallel straight cuts of predetermined length in a mat at a predetermined angle with respect to the surface of said mat;

a first single driving means for urging said first pair of cutting means into and out of said mat; and

a first pair of signalling means for activating said first driving means to urge said first pair of cutting means into and out of said mat;

wherein said transporting means maintains said mat in a constant position relative thereto and transports said mat in a linear direction; and wherein one of said first pair of

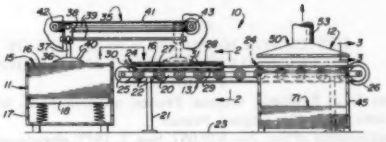


signalling means activates said first driving means to urge said first pair of cutting means into said mat while said mat is transported by said transporting means thereby automatically and simultaneously making two parallel straight cuts of a predetermined length in said mat; and wherein the other of said first pair of signalling means activates said first driving means to urge said first pair of cutting means out of said mat after said cuts have been made.

4,249,438
METHOD AND APPARATUS FOR CUTTING SHEET MATERIAL

Albert W. Kelley, R.R. 1, Box 28, Creamridge, N.J. 08514

Filed Jun. 7, 1979, Ser. No. 46,433
Int. Cl.³ B26D 1/02
U.S. Cl. 83—53 10 Claims

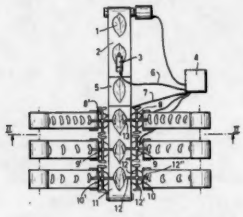


4. Apparatus for cutting plastic sheet material and the like, said apparatus comprising a chamber for connection to a vacuum source, said chamber includes a wall adapted to face toward a sheet to be worked, elongate rule means carried by said wall and having a longitudinally extending sharp edge projecting from said wall, vacuum transmission means communicating through said wall for drawing a work sheet toward said wall and against said rule means for severance thereby, a carrier movable toward and away from said wall for carrying a sheet to be worked, said carrier being movable toward said wall for carrying a sheet into facing relation with said wall and away from said wall permitting unobstructed discharge of a worked sheet from said wall, said carrier comprising a fluid pressure chamber having one side facing toward said wall, and fluid pressure transmission means communicating through said one side for assisting work sheet movement against said rule means.

4,249,439
DEVICE FOR AUTOMATICALLY TAKING OFF ELEMENTS FORMED ON PIECES, PARTICULARLY ON TOBACCO LEAVES

Jean-Francois Leclerc, and Colette Desbois-Chauvette, both of Orleans, France, assignors to Service d'Exploitation Industrielle des Tabacs et des Allumettes, Paris, France

Filed Jan. 24, 1979, Ser. No. 6,106
Claims priority, application France, Feb. 1, 1978, 78 02752
Int. Cl.[3] B26D 7/18
U.S. Cl. 83—71 4 Claims

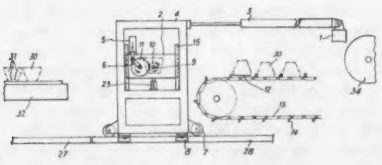


1. A device for automatically taking off elements drawn or formed on pieces carried by a moving support and for displacing and depositing the taken off elements on a take-up conveyor of the type comprising at least one arm mounted to rotate on a shaft located between the support for the elements to be taken off and the take-up conveyor on which the taken off elements must be deposited, each arm bearing a suction disc taking off member wherein said device further comprises means for determining the lay-out of the elements to be taken off of each piece and transmitting said lay-out to a control means, means for positioning and orienting the taking off member with respect to said shaft, and said control means being means for controlling said positioning and orienting means in accordance with the instructions received from said lay-out determining means, whereby the position and orientation of the element to be taken off corresponds to the position and orientation of the take off member of said arm, and drive means arranged to operate in synchronism with the movements of the pieces carried by the moving support and of the take-up conveyor to take off the elements formed on each piece and deposit them in parallel and regular arrangement on said take-up conveyor.

4,249,440
DEVICE FOR HANDLING CROSS TIES OF PRESTRESSED CONCRETE OR ANALOGOUS PRODUCTS

Jean L. J. Feuillade, Cagnes, France, assignor to B. M. Costamagna et Cie, Cagnes, France

Continuation of Ser. No. 830,057, Sep. 2, 1977, abandoned. This application Mar. 19, 1979, Ser. No. 21,825
Claims priority, application France, Mar. 28, 1977, 77 09137
Int. Cl.[3] B26D 7/06
U.S. Cl. 83—155 10 Claims

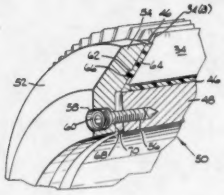


1. Apparatus for handling elongated articles such as ties or the like which are delivered to a first location comprising:
conveyor means, fixed support means,
and gantry means for travelling between said first location and the head of the conveyor means, said gantry means including first means for seizing said articles at their ends, rotating a said seized article by a predetermined amount, delivering it to said fixed support means and positioning said article laterally relative to said fixed support means, said conveyor means including means for entertaining the article from said fixed support means.

4,249,441
APPARATUS FOR CHOPPING STRAND

John V. Sturtz, Toledo, Ohio, assignor to Johns-Manville Corporation, Denver, Colo.

Filed Mar. 9, 1979, Ser. No. 19,203
Int. Cl.[3] D01G 1/04
U.S. Cl. 83—347 12 Claims

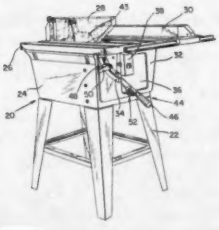


9. A chopper assembly for cutting strands into short lengths, comprising:
a blade roll comprising a blade roll cylinder member, a plurality of chopper blades projecting generally radially therefrom, each of said blades having a cutting edge, a base portion and two sides;
blade retaining means comprising an annular blade retainer positioned at each axial extremity of said blade roll cylinder member, each axially inward surface of said blade retainers having at least one annular groove and a blade retaining elastomer insert positioned between a blade retainer and said blades, said insert having an annular bead disposed in said groove for positioning said insert relative to said blade retainers and said blades, said blades elastically deforming a surface of said insert;
a backup roll adjacent to said blade roll, means for supplying strands between said blades and said backup roll, and
means for rotating said blade roll and said backup roll so that strands delivered from said blades and said backup roll are cut into discrete lengths.

4,249,442
ELEVATION SETTING MECHANISM FOR A TABLE SAW AND THE LIKE

Larry R. Fittery, Newmanstown, Pa., assignor to Black & Decker Inc., Newark, Del.

Filed Jul. 25, 1979, Ser. No. 60,379
Int. Cl.[3] B27B 5/24
U.S. Cl. 83—473 14 Claims



1. In an elevation setting mechanism for a motor-driven tool

in a power tool apparatus which comprises a housing including a tabletop having an opening through which the tool can pass, and assembly means pivotally mounted in the housing and which includes the tool, the mechanism including first control means having a control lever operatively connected to the assembly means for pivoting same, whereby the tool is raised or lowered in the opening to a desired elevation with respect to the tabletop in a quick and coarse setting manner, and locking means for securing the control lever to the housing at a position corresponding to the desired coarse elevation setting for the tool and second control means operatively connected to the assembly means for pivoting the assembly means independently of the control lever, the second control means providing a further elevation adjustment of the tool, the improvement to the second control means comprising:

a pivot nut pivotably mounted to the assembly means, said pivot nut having a threaded opening at transverse to its pivot axis in the assembly means;

a connecting rod having a threaded end disposed in said threaded opening;

means for restraining axial movement of said rod towards or away from the pivot axis of said pivot nut; and

means for rotating said connecting rod such that said threaded end moves axially in said threaded opening, whereby the assembly means pivots about its pivotal mounting in the housing in response to the rotation of said connecting rod, to provide the further elevation adjustment of the tool.

4,249,443

MACHINE FOR SAWING ELONGATED WORK PIECES

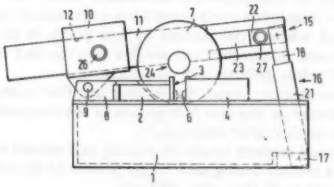
Leopold Jagers, Euskirchen, Fed. Rep. of Germany, assignor to Trennjaeger Maschinenfabrik, Fed. Rep. of Germany

Filed Jun. 22, 1979, Ser. No. 51,163

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1978, 2827776

Int. Cl.³ B23D *47/04, 45/04*

U.S. Cl. 83—490 **14 Claims**



1. A machine for sawing elongated substantially horizontal axis work pieces including a machine frame, a saw blade mounting arm, mounting means providing a first-pivotal connection between said arm and said frame, said arm being longitudinally moveable with respect to said mounting means, a raising and lowering means for said arm connected to said frame, means providing a second pivotal connection between said arm and said raising and lowering means and a substantially vertically aligned saw blade carried by said arm.

4,249,444

STABILIZING MEANS FOR THE CUTTER OF NUT FORMER

Shi-Chung Lee, Kangshan, Taiwan, assignor to Chun Zu Machinery Ind. Co., Ltd., Kangshan, Taiwan

Filed May 10, 1979, Ser. No. 37,768

Int. Cl.³ B26D *5/08, 5/16*

U.S. Cl. 83—588 **8 Claims**

1. A stabilizing apparatus for a cutter comprising:

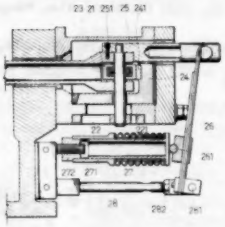
(a) a body;

(b) a moveable assembly in said body for moving said cutter, said assembly including a roller disposed in an end thereof essentially in alignment with a center line of movement of said movable assembly;

(c) a driving block slideably mounted in said body, said block including a cam surface disposed in confronting relationship to said roller;

(d) a helical spring coupled to said body at one end thereof;

(e) a plate spring;



(f) bearing means disposed at an end of said helical spring opposite to said one end for bearing said helical spring upon said plate spring;

(g) first means operatively coupling one end of said plate spring to said movable assembly; and

(h) second means operatively coupling said end of said plate spring opposite to said one end of said body.

4,249,445

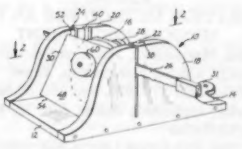
FOOD SLICING APPARATUS

Richard J. Browning, 2440 Jeppesen Acres, Eugene, Oreg. 97401

Filed Jul. 2, 1979, Ser. No. 53,963

Int. Cl.³ B26D *4/42*

U.S. Cl. 83—762 **4 Claims**



1. Apparatus usable in slicing food articles, comprising

an elongate cutting board having an upper surface on which an article to be sliced is supported,

means mounted on said board defining a pair of laterally spaced guide slots for guiding a cutting blade in a planar region which extends at least to said surface and is substantially perpendicular thereto,

a support member mountable on said board, with a first substantially planar face thereof confronting, and being spaced from and substantially parallel to said planar region, for supporting against said face one side of an article to be sliced,

an elongate brace adapted to be supported at one of its end edges on said board, and to contact, at its other end edge, a portion of the other side of an article whose one side is

supported against said support member, with the brace being inclined between said board and said article, and

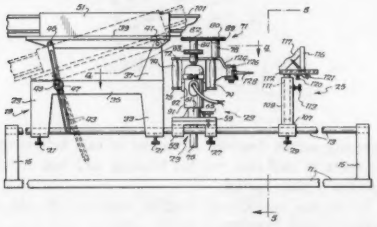
notch means extending laterally of said board for removably receiving the brace's said one end edge pivotally therein, to hold the same a fixed distance from said planar region.

4,249,446

COPING TRACING MACHINE

Peter Tallerico, Jr., 1023 Cleveland Ave., Niagara Falls, N.Y. 14305

Filed Mar. 15, 1979, Ser. No. 20,825
Int. Cl.[3] B23D *53/00*
U.S. Cl. 83—789 **7 Claims**



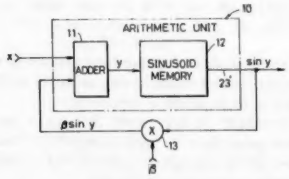
1. Coping tracing apparatus comprising adjustable means for holding a first piece of molding; second means for adjustably holding a second piece of said molding transversely of said first piece; and a cutter assembly between said adjustable means and said means and movable with respect to said second means, said cutter assembly comprising a round, bandsaw blade adapted to contact said second piece of molding, motor means for operating said saw blade, a tracing head having means for tracing a surface contour of said first piece of molding, and guiding means for moving said cutter assembly with respect to said second piece of molding so that said surface contour is duplicated by said saw blade on the end of said second piece of molding as said surface contour of said first piece of molding is traced.

4,249,447

TONE PRODUCTION METHOD FOR AN ELECTRONIC MUSICAL INSTRUMENT

Norio Tomisawa, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jun. 27, 1979, Ser. No. 52,587
Claims priority, application Japan, Jun. 30, 1978, 53/79948; Jun. 30, 1978, 53/79949
Int. Cl.[3] G10H *1/00*; G06F *1/02*
U.S. Cl. 84—1.01 **6 Claims**



1. A method for producing a tone by reading a waveform memory storing a predetermined waveform by an address signal of a selected repetition frequency comprising:

a step of multiplying the output of said waveform memory with a parameter;

a step of adding the multiplication product to said address signal; and

a step of reading said same waveform memory by means of the output resulting from said addition,

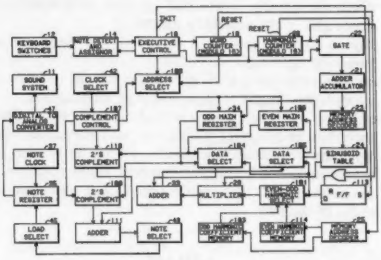
a tone being produced by using the output of said same waveform memory.

4,249,448

EVEN-ODD SYMMETRIC COMPUTATION IN A POLYPHONIC TONE SYNTHESIZER

Ralph Deutsch, and Leslie J. Deutsch, both of Sherman Oaks, Calif., assignors to Kawai Musical Instrument Mfg. Co. Ltd., Hamamatsu, Japan

Filed Apr. 9, 1979, Ser. No. 28,038
Int. Cl.[3] G10H *1/08*
U.S. Cl. 84—1.23 **12 Claims**



1. In a musical instrument having one or more tone generators in which a plurality of data words corresponding to the amplitudes of a corresponding number of evenly spaced reference points defining the waveform of one cycle of an audio signal are transferred sequentially from a note register to a digital-to-analog converter at a rate proportional to the pitch of the tone being generated the improvement for generating said data words comprising;

means for creating a first and second master data set during a computation cycle comprising a first and second portion and wherein the number of data points in the first and second master data sets are less than one half the number of points defining said waveform,

a first memory means for writing said first master data set created during said first portion of the computation cycle to be thereafter read out,

a second memory means for writing said second master data set created during said second portion of the computation cycle to be thereafter read out,

a third memory means for writing data to be thereafter read out,

a transfer means whereby data is read out of said first and second memory means, and

a combination means wherein said data read out of said first and second memory means are combined to form a complete cycle of points for said waveform which is written in said third memory means.

4,249,449

MUSICAL INSTRUMENT

Robin E. Armstrong, P.O. Box 5265 Station A, Toronto, Ontario, Canada

Filed Oct. 23, 1979, Ser. No. 87,494
Int. Cl.[3] G10D *1/00*
U.S. Cl. 84—173 **9 Claims**

1. A stringed instrument comprising:

an outer peripheral frame means defining a closed loop surrounding an open area, said frame means having a given thickness, an upper surface and a lower surface,

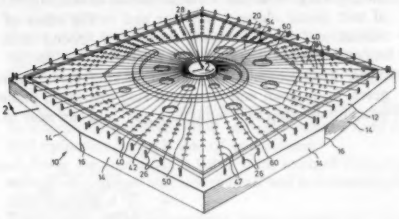
a sounding board extending across said open area,

a plurality of strings,

anchoring means centrally located in said open center, said

anchoring means being adapted to receive and anchor one end of each of said plurality of strings,

peg means distributed around said peripheral frame means, adapted to receive the other ends of the strings, whereby the strings can be tightened and tuned, and whereby the



forces exerted by the tightened strings on said anchoring means are substantially balanced,

outer bridge means in contact with the strings adjacent the peg means, and

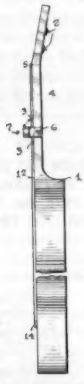
inner bridge means in contact with the strings adjacent the anchoring means.

4,249,450

GUITAR AND CHORD PLAYING ATTACHMENT PIVOTALLY MOUNTED THEREON

William J. Quemore, Sr., 149 E. Church Rd., Blackwood, N.J. 08012

Filed Jun. 21, 1979, Ser. No. 50,646
Int. Cl.³ G10D *3/04*
U.S. Cl. 84—317 **4 Claims**



1. A guitar comprising:

a sound box;

an elongated fingerboard extending from said sound box and having two spaced frets for sounding different chords;

means for stretching a plurality of strings along said fingerboard and over said sound box and for engagement with said two frets;

and a chord playing attachment to enable persons with limited skills to play a narrow repertoire of chords, said attachment including:

a fret and string engaging member,

means for pivotally securing said fret and string engaging member to the sides of said fingerboard and between said frets to enable the sounding of a plurality of chords,

said fret and string engaging member being shorter than the space between said two frets and of width approximately equal to that of said frets,

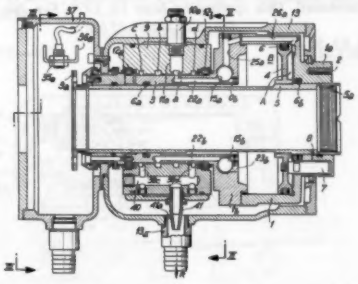
said pivotal means including means to locate surfaces of said fret and string engaging member to engage said two frets and said strings thereagainst in respectively two extreme pivotal positions, and to be spaced from said frets and strings in a third intermediate pivotal position, and means for manipulating said fret and string engaging member so that handicapped and unskilled persons can sound three chords by pivoting said fret and string engaging member to said three positions.

4,249,451

ROTARY HYDRAULIC JACK DEVICE

Jean P. Le Moal, Bougival, France, assignor to La Precision Industrielle, Hauts-de-Seine, France

Filed Jun. 30, 1978, Ser. No. 921,098
Claims priority, application France, Apr. 7, 1977, 77 20474
Int. Cl.³ F01B *31/12;* F15B *13/042*
U.S. Cl. 91—1 **7 Claims**



1. A rotary hydraulic jack device for controlling a clamping chuck comprising:

a rotary cylinder body with a first and second end cover tightly fastened thereto;

a piston slidably guided in said cylinder body defining therein two compartments tightly separated from each other;

a rotary hydraulic joint having a stationary part and a rotary part formed by a tubular extension of said cylinder first end cover;

first and second main pipes connected to said rotary part, said first main pipe carrying a pressurized fluid, said second main pipe providing a discharge path for a fluid;

first and second valves located within the first cylinder body end cover of said rotary cylinder body, said first valve being connected between one of said compartments and said first main pipe, said second valve being connected between said second main pipe and the remaining compartment, said valves comprising:

a housing, each of said housings being located opposite each other and symmetrical with respect to the rotational axis of said rotary cylinder, said housings having a first opening for communicating with one of said main pipes, and a second opening communicating with one of said compartments;

a slide member located within each housing and positionable between first and second ends of said housing, said slide member having at one end a jet communicating with a first end of said housing, and an axial channel connecting said jet via port means with that portion of the housing which communicates with one of said main pipes, said axial channel having lateral openings for communicating with said second opening, said lateral openings being closed by a pressure-sensitive annular elastic ring serving as a check valve for permitting flow towards said second opening, said slide member further including a sealing

joint opening upon movement of said slide member to permit return flow from said second opening,

first and second auxillary pipes connecting the second ends of each housing with a main pipe supplying the other housing;

said valves operating in response to pressure being applied to one of said main pipes, whereby a slide of a valve receiving said pressure is moved to the second end of said housing as fluid passes through said jet, and a slide of the remaining valve is moved to the first position as fluid enters said second end of the remaining valve through said auxillary pipes.

4,249,452

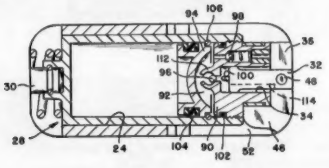
HYDRAULIC BRAKE BOOSTER RESERVE SYSTEM

Arthur K. Brown, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 871,571, Jan. 23, 1978, abandoned, which is a continuation of Ser. No. 722,956, Sep. 13, 1976, abandoned. This application May 15, 1979, Ser. No. 39,429

Int. Cl.[3] F01B *25/02*

U.S. Cl. 91—6 **6 Claims**



3. A hydraulic brake booster comprising:

a housing defining a pressure chamber and having a bore leading to the pressure chamber;

a piston slidably disposed in said housing bore;

said piston being responsive to pressure in the pressure chamber to move relative to the housing to actuate braking;

said piston defining and enclosing a storage chamber which is completely located internally of said piston and said housing; and

said piston carrying valve means to permit communication of pressurized fluid from the pressure chamber to said storage chamber when the fluid pressure level in said storage chamber is substantially less than the fluid pressure level in the pressure chamber, said storage chamber normally storing pressurized fluid therein separate from the pressure chamber when the fluid pressure within the pressure chamber is sufficient to move said piston during braking, and said storage chamber being movable within said housing bore together with said piston;

operator actuating means cooperating with said valve means to open communication between the storage chamber and the pressure chamber when the pressure in the pressure chamber is below that required to move said piston relative to the housing when a brake application is effected.

4,249,453

FLUIDIC MOTOR ACTUATOR

Robert R. Riggs, South Bend, and Paulmer D. Hunt, Mishawaka, both of Ind., assignors to The Bendix Corporation, Southfield, Mich.

Filed Oct. 16, 1978, Ser. No. 952,029

Int. Cl.[3] F01C *21/12*; F15B *9/12*

U.S. Cl. 91—59 **11 Claims**

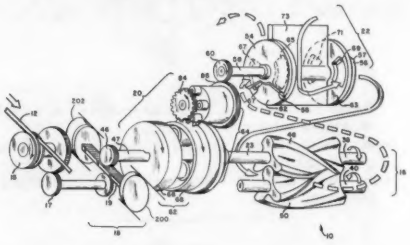
1. A control system comprising:

a housing having a chamber with first, second and third ports, said first port being connected to a source of fluid under pressure;

motor element members connected to said second and third ports of said housing, said motor element members moving in response to said fluid under pressure to create an output force proportional to the pressure of said fluid;

valve means located in said chamber for directing said fluid under pressure in said chamber to one of said second and third ports to establish a first direction of the output force of said motor element member and to the other of said second and third ports to establish a second direction opposite to said first direction for the output force;

epicycle gear means having an input ring gear, planetary gears, a sun gear, and an output ring gear, said planetary gears connecting said input ring gear and sun gear to said



output ring gear, said input ring gear being connected to receive an operational input signal and provide said output ring gear with angular motion, said sun gear being connected to said motor element members for providing said output ring gear with counter angular motion as a function of said output force; and

intermittent motion gear means connected to said output ring gear and said valve means, said intermittent motion gear means responding to said angular motion by operating said valve means to select one of said second and third ports for supplying fluid under pressure and permit said fluid under pressure to operate said motor element in a direction corresponding to said input signal.

4,249,454

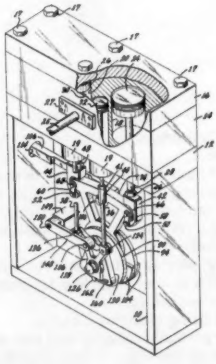
FLUID PRESSURE DRIVEN RECIPROCATING ENGINE

John H. Hedger, P.O. Box 357, Lakeside, Calif. 92040

Filed Dec. 18, 1978, Ser. No. 970,758

Int. Cl.[3] F01B *1/00*; F01L *31/00*

U.S. Cl. 91—186 **4 Claims**



1. A fluid driven reciprocating engine which comprises:

at least two pistons located in cylinders in a block for substantially parallel reciprocating movement within the cylinders;

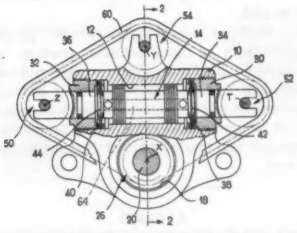
said cylinders closed by upper and lower heads;
each piston having a piston rod having a first and second end, said first end rigidly attached to said piston and extending out of said cylinder through said lower head along the cylinder centerline through substantially fluidtight packing, said second end having a roughly "C" shaped configuration;
a single solid piston rod connecting means partially surrounding and flexibly secured directly to said second end of each piston rod and having an opening surrounding a first crank pin;
a pair of valve means within said bores in said block adapted to selectively introduce fluid into and exhaust fluid from said cylinders on each side of said pistons;
each valve means having a valve stem secured thereto and extending through said lower head and substantially fluid tight packing;
a single solid valve connecting means connected to said valve stems and having an opening surrounding a second crank pin; and
said first and second crank pins attached to an output shaft in an offset relationship whereby as said pistons are driven by said fluid within said cylinders, said first and second crank pins revolve with said output shaft.

4,249,455

HYDRAULIC SERVO-MECHANISM

Gilbert Kervagoret, Argenteuil, France, assignor to Societe Anonyme DBA, Paris, France

Filed Oct. 19, 1978, Ser. No. 952,742
Int. Cl.³ F15B *9/10*
U.S. Cl. 91—383 **8 Claims**



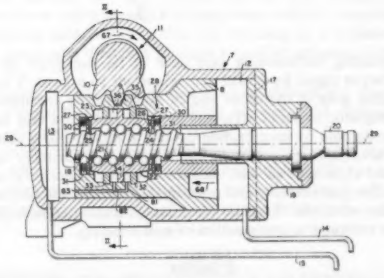
1. A hydraulic servo-mechanism comprising:
a housing having a cavity defined therewithin,
a rotatable input member extending into the cavity and operable by an operator,
a rotatable output member extending into the cavity, said output member being coaxial with said input member and being capable of rotating in response to operation of said input member,
a bore being defined in said housing and having an axis perpendicular and transverse to that of the input and output members,
a fluid motor, in fluid flow communication with said bore,
a distribution control valve being slidably mounted for reciprocation in said bore for controlling fluid flow between a pressure source and said fluid motor, said fluid motor being drivingly connected to said output member for providing a force assisting rotary motion of the latter,
first and second push rod means aligned with and slidably mounted in said bore, each push rod means having a first end situated opposite a corresponding end of said distribution control valve, and a second end projecting outside of said bore,
first and second driving elements rotatably mounted at the respective second ends of the first and second push rod means, said elements having their axes parallel to the axis of said input and output members,
a third driving element rotatably mounted on the housing, said third element having an axis parallel to that of the input and output members,
a first endless transmission member mounted under tension to cooperate operatively for rotative movement with the input member and the first, third and second driving elements,
a second endless transmission member mounted under tension to cooperate operatively for rotative movement with the output member and the first, third and second driving elements.

4,249,456

SERVO-STEERING MECHANISM

Joachim Lückel, Paderborn, and Rolf Povel, Stuttgart, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 10, 1979, Ser. No. 56,235
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1978, 2833316
Int. Cl.³ F15B *11/10*
U.S. Cl. 91—433 **16 Claims**



1. A servo-steering mechanism which includes a steering nut threadably movably connected with the steering worm, and compression spring means for supporting the steering nut with respect to a working piston of the servo mechanism so as to be rotatable and axially movable in directions of a longitudinal axis of the steering worm, characterized in that at least one hydraulic support means is operatively connected with a hydraulic system of the servo mechanism for additionally supporting the steering nut with respect to the working piston in the directions of the steering worm axis.

4,249,457

VACUUM SERVOMOTOR

Naoji Sakakibara, Chiryu, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

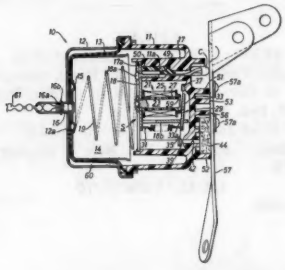
Filed Nov. 22, 1978, Ser. No. 962,993
Claims priority, application Japan, Dec. 14, 1977, 52-151004
Int. Cl.³ F15B *11/08, 13/044*
U.S. Cl. 91—450 **8 Claims**

1. A vacuum servomotor connected to an electric control circuit, conprising:
a one-piece cup-shaped casing with a peripheral wall, said casing having an open end and a bottom wall provided therein with a vacuum nozzle for connection to a source of vacuum and an air nozzle in communication with the atmosphere, said casing being integrally formed at the bottom wall thereof with an open ended cylindrical support structure extending concentrically with and radially spaced from the peripheral wall of said casing, extending inwardly from said bottom wall, and surrounding said air and vacuum nozzles;
a spring-loaded diaphragm assembly hermetically coupled

with the open end of said casing to form an expansible chamber within said casing;

a support plate secured to the open end of said cylindrical support structure located within the expansible chamber; and

a solenoid valve assembly mounted on said support plate and disposed entirely within the open end of said support structure, said valve assembly including a core of magnetic material secured at one end thereof with said support plate and extending into said support structure, a solenoid



winding surrounding said core to be energized by an output signal from said control circuit to provide a magnetic pole at the other end of said core; an armature of magnetic material arranged to be attracted on said magnetic pole by energization of said winding; and a pair of valve parts integral with said armature to normally open and close said air and vacuum nozzles respectively, said valve parts closing and opening said air and vacuum nozzles when said armature is attracted on said magnetic pole in response to energization of said winding.

4,249,458

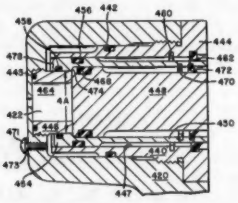
PISTON AND EXTENSIBLE CYLINDER THEREFOR

Lyle E. Massing, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Division of Ser. No. 826,606, Aug. 22, 1977. This application May 11, 1979, Ser. No. 38,151

Int. Cl.[2] **F01B** *31/14;* **F15B** *15/24*

U.S. Cl. 92—13.1 **1 Claim**



1. In a fluid pressure actuated piston assembly with extended travel having a casing with an open end and a closed end defining a cavity therein, passage means for communicating fluid pressure into said cavity to actuate said piston assembly, a sleeve slidable within said cavity in response to said fluid pressure, a piston member slidable within said sleeve in response to said fluid pressure, and coupling means engageable with said piston member and said sleeve for coupling said sleeve to said piston member so that said sleeve moves with said piston member when said piston member moves more than a given axial distance relative to said sleeve and away from said closed end, said sleeve moving with said piston member to allow further axial movement of said piston member away from said closed end, the improvement wherein:

said sleeve includes a differential pressure responsive area responsive to said fluid pressure to prevent the movement of said sleeve away from said closed end until sleeve is coupled to said piston member;

said sleeve including a first area responsive to said fluid pressure to move said sleeve away from said closed end to an extending position wherein said sleeve engages a stop on said casing, said fluid pressure being prevented from communicating with said first area until said sleeve moves a predetermined distance away from said closed end, said sleeve being retained in said extended position by said fluid pressure;

said piston assembly including sealing means adapted to prevent communication of said fluid pressure with said first area until said sleeve moves said predetermined distance away from said closed end;

upon supply of fluid pressure, said fluid pressure acts upon said piston member and said differential area to move said piston member relative to said sleeve and away from said closed end until said piston member engages said coupling means;

whereupon said fluid pressure acts upon said piston member and overcomes said fluid pressure acting upon said differential area to move said piston member and said sleeve away from said closed end until said sleeve moves said predetermined distance away from said closed end;

whereupon said fluid pressure continues to act upon said piston member and said first area to overcome said fluid pressure acting upon said differential area and to further move said piston member and said sleeve away from said closed end to extend said piston assembly;

said sleeve including larger and smaller inside diameter portions, an end of said larger diameter portion defining said first area, said larger and smaller inside diameter portions cooperating to define a radial surface portion therebetween defining said differential pressure responsive area; and

said casing includes a cylindrical member projecting into said cavity with an outer diameter portion, said sealing means being adapted to sealingly engage said outer diameter portion of said cylindrical member and said smaller inside diameter sleeve portion to prevent said fluid pressure from communicating with said first area until said sleeve moves said predetermined distance away from said closed end.

4,249,459

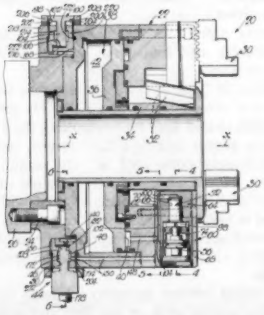
FLUID COUPLING FOR A ROTARY CHUCK

Samuel H. Pruden, East Hartford, Conn., assignor to Cushman Industries, Incorporated, Hartford, Conn.

Filed Nov. 27, 1978, Ser. No. 963,958

Int. Cl.[3] **F15B** *11/08, 13/04;* **B23B** *31/30*

U.S. Cl. 92—106 **3 Claims**



1. A fluid coupling for a rotary body having in its periphery an annular groove with opposite side walls and passages leading from said walls to the opposite ends, respectively, of a

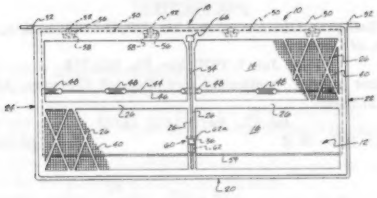
cylinder turning with said body, comprising an annular member having an outer rim part with opposite ends, and an inner ring part intermediate said ends and turnably supported in said body groove, of which said ring part has opposite side faces confronting said groove walls and fluid supply passages leading to said faces, respectively, where they are in register with said passages in the confronting groove walls, said rim part is outwardly spaced from said body periphery to form annular spaces on opposite sides of said ring part, and said ring part has axial play in said groove so as to open a gap between either ring face and confronting groove wall when said ring part is backed against the other groove wall by fluid pressure in said gap, with the gap on either side of the ring part leading to the annular space on the same side of the ring part, and said ring faces and groove walls being machined for a sealing fit of either ring face with the confronting groove wall when backed thereagainst, said rim part has at its ends inward shoulders facing said ring part and being spaced from said body periphery, and resilient rings mounted on said body and projecting outwardly from the periphery thereof into confronting and normally spaced relation with the respective shoulders, with either ring being by the pressure of fluid in the respective annular space flexed into seating engagement with the confronting shoulder to thereby seal said space from the atmosphere.

4,249,460

WALL VENTILATOR CONSTRUCTION

Edward D. McSwain, Rte. 7, Box 325, Lincolnton, N.C. 28092

Filed Aug. 23, 1979, Ser. No. 68,949
Int. Cl.³ F24F 7/00
U.S. Cl. 98—32 **12 Claims**



1. An improved wall ventilator for use in building construction comprising:

(a) a housing comprising peripheral wall means defining a ventilating passageway therethrough, and lattice means extending across said passageway from opposite wall portions and defining a narrow elongate slot across said passsageway, said slot having an enlarged portion therealong; and

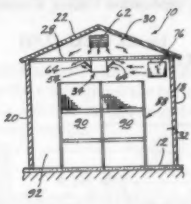
(b) louver means hingedly secured at one end to a wall of said housing, said louver means comprising a plurality of adjacent panels of unitary construction, adjacent panels being connected by at least one strip of like material adapted to flex along a line parallel to an axis through said panels, a panel at an end of said louver means opposite said hinge connection having a control tab of unitary construction therewith and adapted to flex at the junction between the control tab and the panel, said control tab having a knob at an outer free end of same and of unitary construction therewith, said knob being passable through said enlarged portion of said slot and slideable along the remainder of the slot while being held therein, whereby movement of said knob along said slot will cause adjacent panels to move with respect to each other around the flex line through said at least one strip of like material and said louver means to pivot about said hinge connection with said housing whereby said ventilating passageway is opened or closed.

4,249,461

VENTILATING SYSTEM FOR A LIVESTOCK BUILDING

Larry E. Christenson, 903-10th St., Kalona, Iowa 52247; Rick W. Dripps, R.R. 1, Ainsworth, Tex. 52201; John E. Gillette, P.O. Box 604, Kalona, Iowa 52247, and Mark S. Mittleberg, 1528 Tracy La., Iowa City, Iowa 52240

Filed Jun. 21, 1979, Ser. No. 50,767
Int. Cl.³ F24F 7/06
U.S. Cl. 98—38 R **15 Claims**



11. The method of ventilating a substantially closed livestock building having a ceiling with an attic compartment thereabove and a livestock compartment below, comprising

moving ambient air within the building in a substantially horizontal direction through a conduit adjacent said ceiling,

exiting at least some of said moving ambient air upwardly outwardly from said conduit towards said ceiling in a substantially continuous sheet,

introducing fresh air from outside said building through said attic and through said ceiling in a substantially continuous sheet substantially parallel to and adjacent said ceiling, and

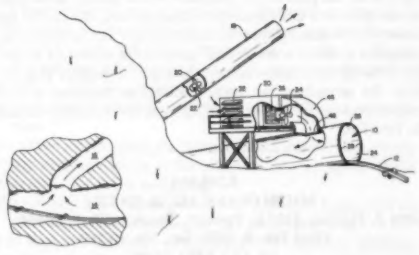
mixing said sheets of ambient and fresh air.

4,249,462

METHOD AND APPARATUS FOR PREVENTING ICE FORMATION AT THE ENTRANCE PORTAL OF A MINE

Louis A. Guzzi, R.D. 5, Box 206, Johnstown, Pa. 15905

Filed Nov. 15, 1978, Ser. No. 960,823
Int. Cl.³ E21F 1/00
U.S. Cl. 98—50 **3 Claims**



1. A method for preventing the formation of ice on the floor at the entrance of a mine shaft adjacent its inlet portal comprising:

forcing air into the shaft at a point located no greater than fifteen meters from the inlet portal, said air being at a pressure greater than atmospheric,

exhausting air from said shaft through an exhaust duct,

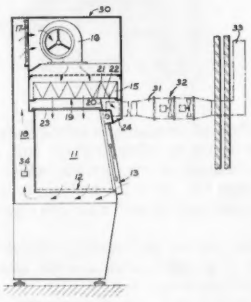
the volume of the forced air being about 110–120% of the air exhausted from the exhaust duct,

heating the air being forced into said shaft prior to the time it enters said shaft,

maintaining the air near the floor of the shaft at the inlet portal at a temperature above the freezing point of water, and

delivering said forced air to the shaft at a location, volume, angle and pressure which combine to force some of said forced air out of the shaft through the inlet portal.

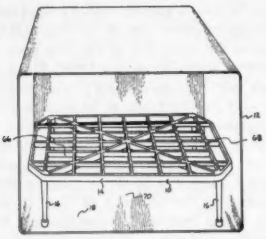
4,249,463
WORKSTATION
Leonard Hornby, Atherton, England, assignor to Howorth Air Engineering Limited, Farnworth, England
Filed May 16, 1979, Ser. No. 39,689
Claims priority, application United Kingdom, May 23, 1978, 21534/78
Int. Cl.³ F23J *11/00*
U.S. Cl. 98—115 LH **1 Claim**



1. A workstation including: an enclosure, a working surface inside the enclosure, the enclosure being bounded by at least one transparent window beneath which is an access aperture via which an operator can gain access to the working surface, an air circulation system including a filter and a fan for drawing air from the enclosure and directing it back to the enclosure via the filter, an outlet downstream of the filter for diverting a proportion of the clean air from the filter for causing a lowering of the pressure inside the enclosure sufficient to cause an inflow of ambient air via the access aperture, the outlet being immediately downstream of the filter and formed by dividing a downstream face of the filter by a baffle into a larger area whence air can pass to the enclosure and a smaller area whence air can pass to a duct leading to atmosphere, the outlet being connected to atmosphere via a secondary fan effective upon operation to draw a substantial proportion of the air from the fan of the air circulation system through the smaller area of the filter, the secondary fan being actuable in response to a contamination sensor in a duct leading from the working surface to the first fan.

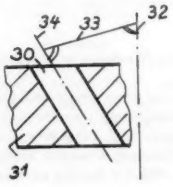
4,249,464
MICROWAVE MEAL RACK
Larry J. Hansen, 1733 S. Fawcett, Tacoma, Wash. 98402
Filed Feb. 9, 1979, Ser. No. 10,760
Int. Cl.³ A47J *37/06*
U.S. Cl. 99—450 **1 Claim**

1. A meal rack cooking utensil for supporting food in a microwave oven, comprising:
- a frame fabricated from a material that is suitable for use in a microwave oven;
- said frame having two spaced-apart parallel sides and two-additional spaced-apart parallel-sides connected at right angles to said first-mentioned parallel sides to define a rectangular frame;
- a first series of spaced-apart parallel support bars that are parallel to said first-mentioned sides, some of said support bars extending outwardly of said second-mentioned sides on opposite sides of said frame;
- a second series of spaced-apart parallel support bars that are parallel to said second-mentioned sides so that said first and second support bars define an open rectangular lattice work therebetween;
- two diagonally aligned support bars extending between opposite corners of said frame;
- extension frame side members connected between said ends of said outwardly extending first-mentioned support bars, and angled side extension members extending between said extension frame side members and the ends of said first-mentioned sides;



- leg receiving sockets formed at the intersection of said first and second-mentioned side members; and
- a leg detachably insertable within each socket to position said frame in a horizontal plane above a floor of a microwave oven;
- said sides and bars having an upwardly facing surface with a raised rib formation on said upwardly facing surfaces.

4,249,465
PROJECTILE
Josef Ballmann, Oberforstbacher Str. 228, D-5100, Aachen, Fed. Rep. of Germany
Filed Jul. 7, 1978, Ser. No. 922,773
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1977, 2731093
Int. Cl.³ F42B *5/02, 11/02*
U.S. Cl. 102—38 R **14 Claims**



1. A projectile for shooting from a gun barrel in response to a force emanating from the aperture of a propellant container, comprising:
- (a) a tubular projectile body; and
- (b) a propulsion member situated between the rear end of the projectile body and the propellant container and comprising a front portion extending into the rear end of the projectile body and adapted to separate from the projectile body upon exiting the barrel and a rear portion extending into the aperture of the propellant container, wherein the front portion of the propulsion member is of larger diameter than the aperture of the propellant container and the rear portion of the propulsion member, and wherein the front portion of the propulsion member is provided with a plurality of axial, spin-producing flow passages extending therethrough and annularly surrounding the longitudinal axis of the projectile body, with the openings of said passages lying nearest the propellant container

aperture being situated outside of the area defined by the aperture.

4,249,466

SABOT PROJECTILE HAVING A PYROTECHNIC COMPOSITION

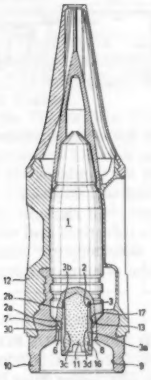
Rudolf Rossmann, Züich; Walter Engel, Wallisellen, and Günther Diewald, Züich, all of Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Bühnle AG, Zürich, Switzerland

Filed Jul. 3, 1978, Ser. No. 921,506

Claims priority, application Switzerland, Jul. 21, 1977, 9055/77

Int. Cl.³ F42B *11/16*

U.S. Cl. 102—60 **2 Claims**



1. A sabot projectile comprising:

a projectile body having a tail portion;

a flare composition provided for the projectile body;

said tail portion of the projectile body having a recess possessing a base;

only part of the flare composition protruding into the recess of the tail portion of the projectile body;

a tubular jacket opened at both ends secured in the recess and extending toward the base of the recess, said jacket surrounding the part of the flare composition protruding out of the tail portion of the projectile body;

said tubular section having an inner surface provided with a ring-shaped groove; and

the flare composition being in direct contact with and anchored in said ring-shaped groove and extending forward of said jacket to completely fill said recess.

4,249,467

MOBILE APPARATUS FOR RECEIVING AND LAYING AS ASSEMBLED TRACK SWITCH OR CROSSING SECTION

Josef Theurer, Vienna, and Friedrich Oellerer, Linz, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Oct. 22, 1979, Ser. No. 87,063

Claims priority, application Austria, Nov. 16, 1978, 8195/78

Int. Cl.³ E01B *27/06*

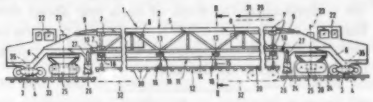
U.S. Cl. 104—3 **7 Claims**

1. A mobile apparatus for receiving and laying an assembled track switch or crossing section consisting of rails fastened to ties, which comprises

(a) a bridge-like carrier frame having two end regions,

(b) a respective track-bound undercarriage in each of said end regions, the undercarriages supporting the carrier frame for mobility along a track,

(c) a track-laying undercarriage in each of said end regions, each track-laying undercarriage being mounted independently of the track-bound undercarriages for pivoting about a vertical axis through an arc of at least 90° and for vertical adjustment, and



(d) a hoisting and transport means mounted on the carrier frame between the end regions, the hoisting and transport means including a device for gripping the assembled track switch or crossing section.

4,249,468

MOBILE TRACK TAMPING MACHINE

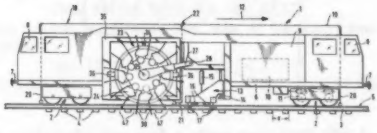
Richard Klaar, Gresten, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed May 10, 1979, Ser. No. 37,502

Claims priority, application Austria, Jun. 19, 1978, 4435/78

Int. Cl.³ E01B *27/16*

U.S. Cl. 104—12 **8 Claims**



1. A mobile track tamping machine mounted for continuous advancement in a working direction at a selected forward speed on a track including two rails fastened to successive ties resting on ballast defining cribs therebetween, for tamping ballast under the successive ties during the continuous advancement of the machine, which comprises

(a) a frame,

(b) a tamping tool carrier vertically adjustably mounted on the frame, the carrier being mounted for rotation about a horizontal axis extending transversely to the track and being substantially symmetrical with respect to the axis of rotation, and the carrier including

(1) an annular support concentric about the axis of rotation,

(c) a drive for rotating the tamping tool carrier at substantially the same speed as the selected forward speed of the machine, the drive including

(1) a rotary shaft having two ends rotatably supported on the frame and extending in the horizontal axis,

(d) at least one assembly of eight pairs of vibratory tamping tools mounted on the tamping tool carrier, the sixteen tamping tools extending in a vertical plane adjacent one of the rails, substantially radially with respect to the axis of rotation in a rest position and peripherally equidistantly with respect to the annular support for sequential immersion in the successive cribs during the continuous advancement of the machine and the rotation of the tamping tool carrier, the tamping tools having tamping jaws for immersion in the cribs and the distance between the jaws of adjacent ones of the tools approximating the average combined width of a crib and a tie, and the drive rotating the carrier in a direction imparting to the tamping tools a movement opposite to the working direction of the machine,

(e) a pivot on the annular support for each one of the tamping tools, the pivots extending substantially parallel to the

axis of rotation for reciprocating the tamping tools in the vertical plane about the pivots thereof between the rest position and a tamping position, the diameter of the annular support being selected to enable the support to carry sixteen equidistantly spaced pivots for the tools, and

(f) drive means connected to the tamping tools and arranged for reciprocating the tools of each pair about the pivots thereof towards each other from the rest position onto the tamping position and against a tie positioned intermediate the tamping tools of the pair.

4,249,469

SAFE HAVING COMBINATION LOCKING MECHANISMS

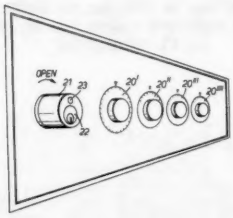
William J. Craske, Chigwell, England, assignor to Crado Devices Limited, Billericay, England

Filed Jun. 19, 1978, Ser. No. 916,784

Claims priority, application United Kingdom, Jun. 20, 1977, 25767/77

Int. Cl.³ E05G *1/04*

U.S. Cl. 109—59 R **10 Claims**



1. A safe comprising walls, a door and safe-locking means, the safe-locking means comprising a bolt member, a first release slide which is able to move longitudinally in the safe-locking means and which operates the bolt member by moving the bolt member to a withdrawn position in which the safe is unlocked, a second release slide which is able to move longitudinally in the safe-locking means and which operates the bolt member by moving the bolt member to a withdrawn position in which the safe is unlocked, at least one set of combination dial assemblies, and a gate assembly for each combination dial assembly, the gate assemblies being such that they prevent the first and second release slides from moving longitudinally to operate the bolt member until either of first and second combination codes set in the safe-locking means are correctly dialed, the first combination code enabling the first release slide to move longitudinally and operate the bolt member, the second combination code enabling the second release slide to move longitudinally and operate the bolt member, and means for longitudinally moving one of said first and said second release slides when a corresponding one of said first and said second combination codes is correctly dialed.

4,249,470

FURNACE STRUCTURE

Joel Vatsky, Millburn, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Division of Ser. No. 920,295, Jun. 29, 1978, Pat. No. 4,206,712. This application Oct. 2, 1979, Ser. No. 81,184

Int. Cl.³ F23K *1/00*

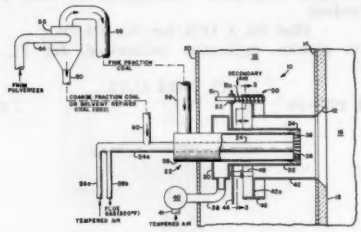
U.S. Cl. 110—232 **10 Claims**

1. In combination with a particle separator for separating a mixture of a transport fluid and pulverized coal into a coarse coal fraction having a first portion of the transport fluid and a fine coal fraction having a second portion of the transport fluid, a furnace having a combustion chamber, a burner assembly for burning the pulverized coal, and a windbox disposed adjacent to said furnace for providing combustion supporting gas to the burner assembly, said burner assembly comprising

a tubular element operatively connected to said separator for receiving said coarse coal fraction;

means for introducing a heating fluid to said tubular element to initiate devolutilization of said coarse coal fraction;

a shell element disposed concentrically about said tubular element and operatively connected to said separator for



receiving and for achieving rapid devolatilization of said fine coal fraction; and

flow control means for regulating the flow of combustion supporting gas from said windbox,

said tubular and said shell elements cooperating to effect combustion of the pulverized coal within said combustion chamber under stoichiometric conditions resulting in reduced production of nitrogen oxides.

4,249,471

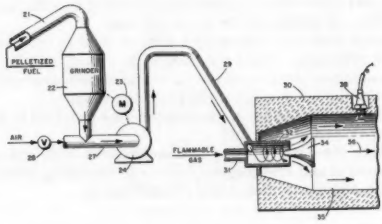
METHOD AND APPARATUS FOR BURNING PELLETIZED ORGANIC FIBROUS FUEL

Rudolf W. Gunnerman, 1500 Valley River Dr., Ste. 220, Eugene, Oreg. 97401

Filed Jan. 29, 1979, Ser. No. 7,171

Int. Cl.³ F23G *5/00*

U.S. Cl. 110—243 **2 Claims**



1. An apparatus for burning simultaneously a particulate solid organic fibrous fuel and a combustible gas comprising a furnace having a housing enclosing a combustion chamber for burning said fuels,

means for mixing said fuels comprising a housing supported in the combustion chamber and enclosing a space for receiving said fuels,

conduit means for flowing said combustible gas axially into said mixing means,

means for blowing with air said particulate fuel into said space of said mixing means tangentially to flow of said combustible gas,

means comprising a vortex for turbulent flow of mixed particulate fuel, air and combustible gas from the mixing means into the combustion chamber,

means for igniting the resulting mixture of fuels in the combustion chamber, and

means for exhausting the resulting combustion gases from

the combustion chamber, said housing enclosing a combustion chamber has a cylindrical shape and is disposed with its longitudinal axis substantially horizontal, the means for introducing the combustible gas into the mixing chamber is a first conduit connected to a source of combustible gas under pressure, and said mixing means is disposed in the combustion chamber with its axis substantially parallel to the axis of said housing enclosing the combustion chamber, the means for introducing particulate solid fuel is a second conduit associated with a source of air and connected to said mixing means at an angle whereby the air enters the tubular mixer tangent to the flow of gas from the first conduit, and the apparatus comprises means for mixing particulate solid organic fibrous material with the air in the second conduit, and means for blowing the air through the second conduit to suspend said particulate solid fuel and carry it into said mixer.

4,249,472

THERMAL REACTORS

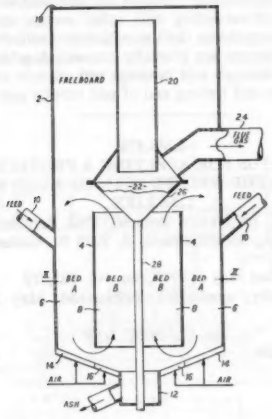
Douglas A. Mitchell, 7 Clifton Gardens, Eaglescliffe, Stockton-on-Tees, Cleveland, England

Continuation of Ser. No. 775,206, Mar. 7, 1977, abandoned. This application Nov. 6, 1978, Ser. No. 957,727

Claims priority, application United Kingdom, Mar. 12, 1976, 9972/76

Int. Cl.³ F23G *5/00, 7/00;* F22B *1/02*

U.S. Cl. 110—245 **14 Claims**



1. A thermal reactor comprising a furnace vessel having a vertically aligned exterior shell, an upstanding partition shell coaxially located inside the exterior shell and disposed within the lower region thereof to define within said vessel, on the opposing sides of said partition shell, first and second coaxial compartments in communication with each other adjacent both the upper and lower regions of said partition shell, an air permeable bottom wall formed in said exterior shell below said partition, said bottom wall being inclined downwardly from said first to said second compartment, a mass of particulate material forming a first bed in the first compartment, a further mass of particulate material forming a second bed in the second compartment, the upper surfaces of said first and second beds, in the static condition of the reactor, being below the level of the top of the partition shell, diverter means located at least above the second compartment and extending toward said first compartment and spaced above said partition shell to define, with the top of the partition shell, an outlet slot from the second compartment into the first compartment, means for fluidizing both said first and second beds, including means for controlling the fluidization of each of said first and second beds respectively such that the fluidization of the first bed is substantially uniform and to a lesser extent than the fluidization of the second bed, and the material in the first compartment is caused to flow generally downwardly and the upper surface thereof remains below the level of the top of the partition shell, and the material in the second compartment is caused to flow generally upwards at a velocity to impinge on said diverter means and be deflected by said diverter means through said outlet slot as a substantially horizontal cascade extending right across and falling onto, the entire area of the upper surface of the first bed, and in conjunction with said bottom wall to establish continuous circulation of material around the upstanding partition shell, at least one inlet means from the exterior of the furnace vessel for supplying material to be reacted to the upper region of said first compartment, and at least one outlet means from the second compartment for discharging non-combustible product and bed material and a flue outlet communicating with said first and second compartments for discharge of gas.

4,249,473

WARNING SIGNAL PRODUCING DEVICE FOR PROTECTIVE BREATHING APPARATUS

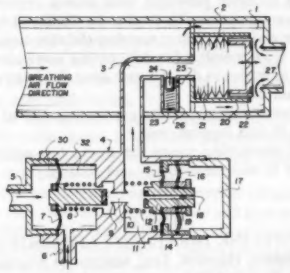
Adalbert Pasternack, Bad Schwartau, and Ernst Warncke, Lübeck, both of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed May 9, 1979, Ser. No. 37,377

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1978, 2826787

Int. Cl.³ G01L *19/12;* F16K *37/00*

U.S. Cl. 116—70 **12 Claims**



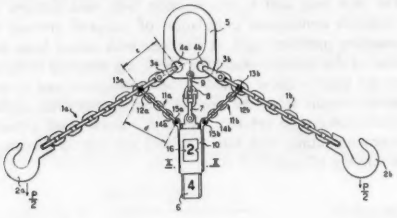
1. A warning device for indicating a reduction of breathing gas beyond a predetermined level in an air breathing device having a pressure gas supply comprising an air conduit having a bore extending therethrough for the passage of breathing air from an entrance end to an exit end, a control device operatively connected to said pressure gas supply, a pressure line extending from said control device and terminating in said bore of said air conduit, said control device including a passage means for selectively establishing fluid communication between the pressure gas supply and the pressure line, a first valve mounted in said control device operative to open said passage means to establish said fluid communication responsive to the reduction of breathing gas and a second valve member in said control device being operative to alternately open and close said passage means and vary the pressure in said pressure line, and warning means operatively connected to said pressure line in said bore and being movable in response to a gas supply pressure in said pressure line into at least a partially exit end blocking position in said air conduit so as to vary the pressure thereof in an oscillating manner to signal as the warning to the user of the reduction of the breathing gas.

4,249,474

LOAD-CARRYING SLINGS

Jean F. Archer, Villennes sur Seine, France, assignor to STAS Societe Technique d'Accessoires Specialises, Sartrouville, France

Filed Apr. 11, 1979, Ser. No. 29,268
Claims priority, application France, Apr. 17, 1978, 78 11809
Int. Cl.[3] B66C *1/40*; G01L *5/04*
U.S. Cl. 116—212 4 Claims



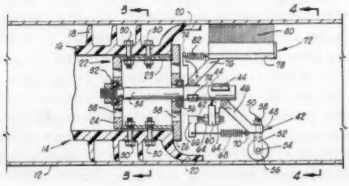
1. A sling assembly comprising:
a support adapted to be suspended from a crane;
a pair of load-bearing strands each connected at one end to said support and provided with load-engaging means at their opposite ends whereby, depending upon the locations of connection of said load-engaging means to a load, said strands can be spread apart to include a variable angle with a vertical, thereby varying the maximum permissible load which can be supported by said strands; and
an indicator for displaying the maximum permissible load which can be supported by the strands as a function of the angle included between the strands and a vertical, said indicator comprising:
a scale member provided with indicia representing the maximum permissible load to be displayed by said indicator and an indicator member slidably connected with said scale member for designating particular indicia of said indicator in dependence upon the relative positions of said members,
first connecting means for connecting one of said members to said support, and
second connecting means for connecting portions of the other of said members to said strands.

4,249,475

PIPELINE TREATMENT APPARATUS

David L. Lindsey, Houston, Tex., assignor to Mustang Services Company, Houston, Tex.

Filed Oct. 10, 1978, Ser. No. 950,246
Int. Cl.[3] B05C *7/08*
U.S. Cl. 118—105 2 Claims



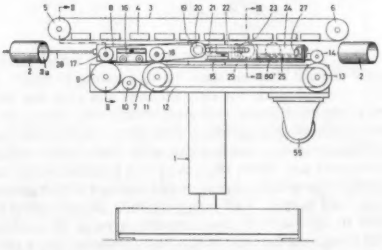
1. Apparatus for treating the interior surface of a pipe comprising:
mounting means adapted for longitudinal movement through the pipe, which means includes:
a tubular pig having a leading end and a trailing end;
a cylindrical tubular body having a leading end, and having a trailing end dimensioned for insertion into the trailing end of the pig, said body having at least one hole in its wall for passage of an anchoring means therethrough to secure the tubular body in the pig;
a flat circular end plate across the leading end of the body, having a central opening formed therein for receiving a bearing;
a flat end plate dimensioned to overlap the trailing end of the cylindrical body and forming a flange abutting the trailing end of the pig when the leading end of the tubular body is inserted therein, and having a central opening for receiving a bearing;
a bearing secured in each of said central openings;
roller means connected to said mounting means and including:
at least one roller means skewable to selected positions for rolling contact with the internal wall of the pipe along a helical path as the mounting means is moved longitudinally through the pipe; and
means for continuously resiliently biasing said roller means outwardly in a radial direction regardless of the position to which said roller means are skewed;
a treating element connected to the mounting means for movement therewith; and
means interconnecting said roller means and treating element to cause the treating element to contact the internal wall of the pipe along a helical path which is complementary in configuration to the path traced out by said roller means as said roller means undergoes rolling contact with the internal wall of the pipe as said mounting means is moved longitudinally through the pipe, and wherein said means interconnecting said roller means and treating element comprises a shaft to which said roller means and treating element are pivotally connected, which shaft is mounted through said bearings and extends axially outward from said trailing end of said tubular pig.

4,249,476

APPARATUS FOR APPLYING A PROTECTIVE COATING TO THE WELDED SEAM OF A CAN BODY OR THE LIKE

Paul Opprecht, Im hintern Bernold, 8962 Bergdietikon, and Siegfried Frei, Schoeckstrasse, 3, 9008 St. Gallen, both of Switzerland

Filed May 5, 1978, Ser. No. 903,072
Claims priority, application Switzerland, May 23, 1977, 6336/77
Int. Cl.[3] B05C *7/08*
U.S. Cl. 118—204 13 Claims



1. An apparatus for applying a protective coating to a seam, such as a welded or soldered seam, of can bodies, comprising:
a first device for feeding the can bodies along a predetermined path of travel;
a second device arranged approximately along a center line of said path of travel;
means containing a mass of material for forming the protective coating;
said second device comprising at least one applicator roll which is at least partially immersible in said coating mass

for the application of the coating mass to the inside of said seam;

said second device comprising means for driving said applicator roll;

said driving means comprising: a plurality of rolls; an endless first traction element guided about said plurality of rolls;

said driving means further including means for rotatably connecting said applicator roll with one of said plurality of rolls;

a second motor-driven endless traction element arranged neighboring said path of travel;

said first and second traction elements having parts thereof extending essentially parallel to one another in order to transmit the movement of the second traction element to said first traction element; and wherein,

the movement transmission is accomplished by direct contact of the traction elements or an intermediately situated wall of one of the cans.

4,249,477

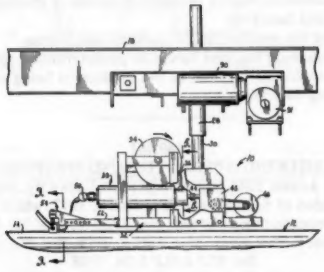
APPARATUS FOR USE IN COATING LONGITUDINALLY WELDED PIPE

Howard W. Christie, Kansas City, Mo., and Walter D. Hodge, Shawnee Mission, Kans., assignors to H. C. Price Co., Bartlesville, Okla.

Division of Ser. No. 780,837, Mar. 24, 1977, Pat. No. 4,126,718. This application Jul. 31, 1978, Ser. No. 929,282

Int. Cl.³ B05C *5/04, 11/04*

U.S. Cl. 118—/413 **3 Claims**



1. A device for applying mastic material to an area of the surface of longitudinally welded pipe adjacent the weld bead, said device comprising:

a framework adapted to be moved along said pipe in alignment with said weld bead;

means on said framework for carrying a spool having a winding of said mastic material thereon in rope form;

extruder means on said framework, said extruder means being adapted to receive the mastic material and deposit a uniform quantity of same on said pipe surface in an area along said weld bead;

plural doctor blade elements coupled with said framework and extending in opposite directions from said raised weld bead, each of said elements presenting a flat linear surface contacting said weld bead and also a point on the surface adjacent said weld bead,

each of said blade elements being movable independently of the other blade element;

spring means urging said blade elements against said weld bead and said surface; and

means for heating each of said blade elements.

4,249,478

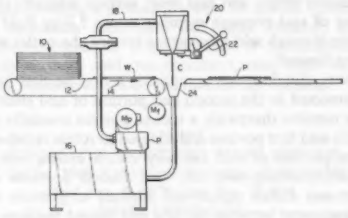
CONTROLLER FOR CURTAIN COATER

Rolf Gruener, 7 Shangri La., Wallingford, Conn. 06492

Filed Mar. 23, 1979, Ser. No. 23,468

Int. Cl.³ B05C *5/00*

U.S. Cl. 118—668 **1 Claim**



1. In a machine for feeding flat work pieces through a liquified curtain for coating the upper surfaces with a layer of coating material, the thickness of which layer is proportional to the speed at which the work pieces are fed through the curtain and the volume rate of flow for the liquified curtain, said machine including means for varying the speed of an infeed conveyor for the work pieces and a positive displacement pump driven by a variable speed remotely controllable motor to provide the liquid flow rate for the curtain, the improvement comprising:

(a) means for producing a first series of electrical pulses (Pf) proportional in frequency to the speed of the infeed conveyor,

(b) means for producing a second series of electrical pulses (Pp) proportional in frequency to the angular speed of rotation of said positive displacement pump,

(c) electronic ratio means for calculating the numerical ratio (Pf/Pp) between said first and second electrical pulse frequencies and producing discrete digital output signals indicative of the instantaneous condition of said numerical ratio as greater than or less than a predetermined ratio preset in said ratio means,

(d) low and high preset counter modules coupled to said electronic ratio means to provide discrete outputs when said instantaneous count exceeds low and high predetermined limits preset therein, and

(e) means for varying the angular speed of rotation of said pump in response to said discrete low and high preset ratio limits, whereby the thickness of said coating is continuously kept in a predetermined range in spite of variations made to the speed of work pieces on the infeed conveyor.

4,249,479

FLUID DISPENSING APPARATUS FOR USE WITH A CONTAINER ASSEMBLING MACHINE OR THE LIKE

William R. Eddy, Kansas City, Mo., and Frank P. Richards, Prairie Village, Kans., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 6, 1979, Ser. No. 55,660

Int. Cl.³ B05C *1/02, 5/02, 7/06*

U.S. Cl. 118—708 **15 Claims**

1. Apparatus for supplying a predetermined quantity of fluid from a source of said fluid to a location comprising in combination:

flexible tube means for conveying a quantity of fluid therethrough to an outlet end portion thereof, at least a portion of said tube means being positioned in a generally circular loop;

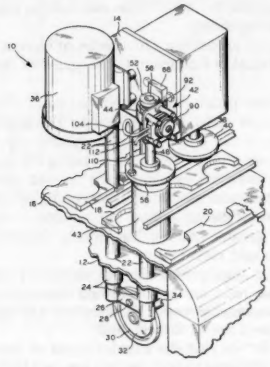
support means operatively related to said flexible tube means for supporting said loop;

shaft means having first and second end portions and journaled on said support means for rotation about an axis of rotation generally coaxial with said loop;

pressure member means drivingly connected to the first end portion of said shaft means for rotation therewith;

body means carried by said support means and disposed about said loop and said pressure member means and having a generally circular inner surface located sufficiently close to said pressure member means and said loop so that said tube means is pinched between said pressure member means and said inner surface whereby the rotation of said pressure member means forces fluid in said loop through said tube means toward the outlet end portion thereof;

one-way clutch means comprising a first portion drivingly connected to the second end portion of said shaft means for rotation therewith; a second portion coaxially aligned with said first portion and adapted to rotate relative to the first portion of said one-way clutch means; and means interconnecting said first and second portions of said one-way clutch means and adapted to provide driving engagement between the first and second portions of said one-way clutch means in response to rotation of said second portion of said one-way clutch means in a first direction about the axis of rotation of said shaft means, and, alternately, adapted to drivingly disengage the first and second portions of said one-way clutch means in response to rotation of said second portion of said one-way clutch means in an opposite direction about the axis of rotation of said shaft means;



actuator means drivingly connected to said second portion of said one-way clutch means for rotating the second portion of said one-way clutch means about the axis of rotation of said shaft means;

reciprocatable frame means fixedly secured to said support means, whereby said support means reciprocates with said reciprocatable frame means; and

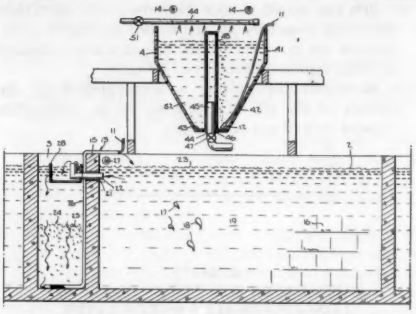
fluid dispensing means movably mounted on said reciprocatable frame means and in fluid flow communication with the outlet end portion of said tube means, said fluid dispensing means being operatively related to said reciprocatable frame means whereby said fluid dispensing means moves with said reciprocatable frame means during reciprocation thereof, said fluid dispensing means being further adapted to cease reciprocating movement when said fluid dispensing means contacts an object upon which fluid is to be dispensed from said fluid dispensing means while said reciprocatable frame means continues reciprocating movement thereby causing relative movement between said fluid dispensing means and said reciprocatable frame means, said fluid dispensing means being further provided with means operatively engaging said actuator means whereby said relative movement between said fluid dispensing means and said reciprocatable frame means results in incremental rotation of said shaft means via said one-way clutch means in said first direction about said axis of rotation.

4,249,480

APPARATUS AND METHOD FOR REARING SHRIMP

Charles Dugan, Goulds, and Timothy Dugan, Homestead, both of Fla., assignors to Farm Fresh Shrimp Corporation, Fort Lauderdale, Fla.

Filed Jul. 18, 1978, Ser. No. 925,793
Int. Cl.³ A01K *61/00*
U.S. Cl. 119—2 **16 Claims**



1. A method for rearing shrimp under controlled conditions through the larvae stage comprising:

providing a common enclosure having a medium therein and habitats disposed in the medium for male and female adult shrimp;

maintaining the male and female adult shrimp in the common enclosure through a plurality of cycles of mating, spawning and hatching;

filtering the medium in the common enclosure;

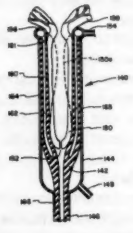
and collecting hatched larvae at predetermined times from the enclosure medium as the medium is being conveyed during filtering.

4,249,481

MILKING APPARATUS AND METHOD

Frank H. Adams, 1246 Indiana Ave., Salt Lake City, Utah 84104

Division of Ser. No. 804,651, Jun. 8, 1977, which is a continuation-in-part of Ser. No. 770,342, Feb. 22, 1977, abandoned. This application Apr. 3, 1979, Ser. No. 26,702
Int. Cl.³ A01J *5/04, 5/08*
U.S. Cl. 119—14.02 **6 Claims**



5. A method for providing improved lactation comprising:

preparing an inflatable sleeve as an insert for a cylindrical shell by forming the inflatable sleeve as an insert having an inflatable, annular lumen between an outer wall and an inner wall, the inflatable, annular lumen extending the length of the inflatable sleeve corresponding to the length

of a mammalian teat engaged by the inflatable sleeve, the inner wall being fabricated with a thinner, upper wall section and downwardly becoming progressively thicker so as to be preferentially distensible upon positive air pressure being directed into the annular lumen thereby imparting a downwardly directed, peristaltic pumping action to a mammalian teat engaged thereby, the inflatable sleeve including an inflation port and a neck portion;

providing a milking apparatus for the mammalian teat by forming a rigid, cylindrical shell as a housing for the inflatable insert, the shell having an open end and a closed end with a yoke and a vacuum port adjacent the closed end, the inflatable sleeve being inserted with the neck portion extending through the yoke, the insert nesting in sealing relationship in the shell;

enveloping a mammalian teat with the insert and the shell;

cyclically imposing a vacuum on the vacuum port to expand the insert outwardly toward the rigid shell;

cyclically pressurizing the annular lumen of the insert to impose a downwardly directed, peristaltic constrictive force on the mammalian teat; and

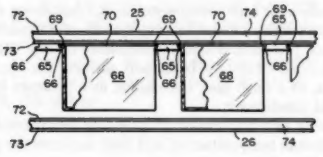
drawing a vacuum on the neck of the insert.

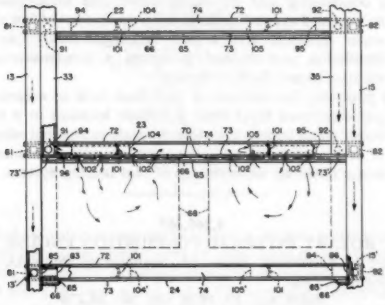
4,249,482

AIR CONDITIONED LABORATORY RACK FOR ANIMAL CAGES

James R. Harr, 51 Ridge Rd. East, Rochester, N.Y. 14621

Filed Jul. 17, 1979, Ser. No. 58,142
Int. Cl.³ A01K *1/00*
U.S. Cl. 119—17 **14 Claims**





1. A storage rack for animal cages, comprising

a frame including a plurality of spaced, hollow, upstanding legs,

a plurality of generally flat, hollow shelves supported on said legs in vertically spaced relation, each of said shelves having its interior divided into at least two separate chambers,

an air filtration system connected to said rack and having an outlet connected through certain of said hollow legs with the interior of one chamber in each of said shelves, and having an inlet connected through others of said hollow legs with the interior of the other chamber in each of said shelves, and

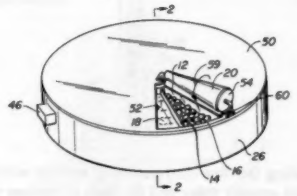
means for releasably supporting a plurality of animal cages on each of said shelves, each of said cages having only one open end, and said open end of each cage communicating through a first plurality of spaced openings in the associated shelf with said one chamber therein, and communicating through a second plurality of spaced openings in the associated shelf with said other chamber therein, whereby filtered air from said inlet is circulated successively through said one chambers, said cages and said other chambers back to the inlet of said system.

4,249,483

AUTOMATIC MOIST PET FOOD SERVER

Reda Z. Sobky, 1049 Keith Ave., Berkeley, Calif. 94708

Filed Sep. 6, 1979, Ser. No. 72,944
Int. Cl.³ A01K *5/02*
U.S. Cl. 119—51.12 **10 Claims**



1. A device for dispensing moist pet food at preselected time intervals comprising:

a tray having multiple upwardly opening compartments disposed circumferentially about a central vertical axis and containing moist pet food;

a circumferentially continuous sheet of wrapping material overlying the compartments of the tray and sealing the contents in said compartments so that the contents remain moist;

means for serially exposing the compartments at preselected time intervals; and

means for removing the wrapping material from the exposed compartments as they are exposed so that moist pet food is provided at selected intervals for the pet.

4,249,484

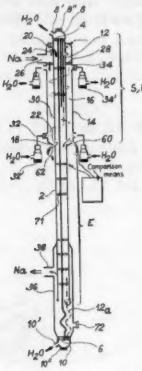
STEAM GENERATOR WITH AN INTEGRATED REHEATER FED WITH A LIQUID METAL

Louis de Nucheze, Paris, and Marcel Robin, Sevres, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 10, 1979, Ser. No. 2,458
Claims priority, application France, Jan. 18, 1978, 78 01346
Int. Cl.³ F22B *1/02*
U.S. Cl. 122—32 **3 Claims**

1. A steam generator having an integrated reheater fed with a liquid metal and comprising a shell of cylindrical shape, wherein provision is made within the shell of said generator for a bundle of straight tubes fixed in a tube plate at each end, said tube plate being associated respectively with a bottom water inlet header and with a top steam outlet header, a liquid metal outlet nozzle provided in the lower portion of said shell, a jacket which surrounds the upper portion of said shell and defines an annular space between said jacket and said shell, the top portion of said jacket being provided with a nozzle for the introduction of said liquid metal into said heat exchanger at the top portion of said annular space, said annular space communicating with the interior of said shell through a first series of windows formed in said shell in the upper portion of said annular space and through a second series of windows formed

in said jacket in the lower portion of said annular space, said annular space containing a plurality of helical tubes connected to a bottom header for the admission of steam to be reheated and to a top header for the discharge of reheated steam, said windows of the first series being provided with means for regulating the rate of flow and for varying the extent of opening and with means for controlling said flow-regulating means



and adjusting the flow distribution of sodium which circulates within said annular space and the flow of sodium which penetrates into said shell through the windows of the first series, and temperature sensors placed within said annular space and within said shell immediately above the second series of windows, said sensors being connected with means for comparing the measurements carried out by said sensors.

4,249,485

FEED WATER PREHEATER

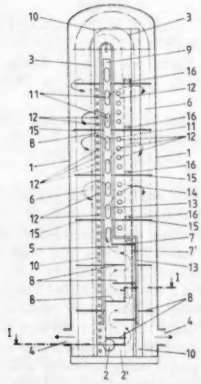
Jakob Brul, Nussbaumen, and Helena Riegger, Zurich, both of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed May 9, 1979, Ser. No. 37,510

Claims priority, application Switzerland, May 31, 1978, 5941/78

Int. Cl.³ F22D *1/28*

U.S. Cl. 122—441 **8 Claims**



1. A feed water preheater, comprising:
a warm tube bundle;
a cold tube bundle;
a steam distrubution duct arranged between the warm tube bundle and the cold tube bundle;
the warm tube bundle being divided into first and second warm tube bundle portions, the first warm tube bundle portion forming a desuperheater bundle and the second warm tube bundle portion forming a condenser bundle; and
means for isolating the desuperheater bundle from the condenser bundle.

4,249,486

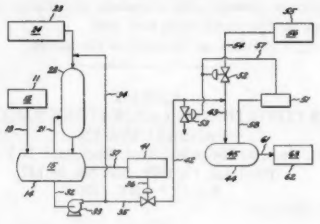
STEAM CONDENSATE AND WASTE WATER RECYCLING PROCESS

Frank S. Potochnik, Scotia, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Aug. 21, 1979, Ser. No. 68,373

Int. Cl.³ F22D *5/26*

U.S. Cl. 122—451 R **7 Claims**



1. A process for recovering waste heat, comprising the steps of: (a) substantially closed heating system of a directing prepurified hot pressurized steam condensate from a distillation process located remotely from said process for recovering waste heat, to a flash tank maintained at a pressure less than that of said condensate;
(b) flashing said condensate to an extent determined by the equilibrium temperature of said flash tank and the pressure of said condensate;
(c) venting any resulting expanded steam from said flash tank to a condenser;
(d) condensing said expanded steam and simultaneously mixing said expanded steam with an amount of hot waste water obtained from a heat exchanger utilized in said distillation process and returning a condensate-water mixture to said flash tank; and
(e) pumping the contents of said flash tank in excess of a predetermined level from a remote location to a steam boiler water system mix tank; wherein substantial amounts of said condensate are recovered, so as to minimize the water make-up requirements of said heating system.

4,249,487

ROTARY INTERNAL COMBUSTION ENGINE

Robert B. Chambers, Boise, Id., assignor to Power-D, Inc., Longmont, Colo.

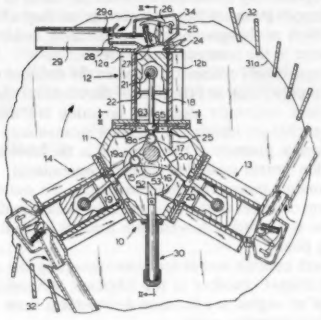
Filed Apr. 27, 1979, Ser. No. 34,274

Int. Cl.³ F02B *57/00*

U.S. Cl. 123—44 C **8 Claims**

1. A rotary internal combustion engine comprising a housing rotatably supported by stationary members, a plurality of cylinders and associated pistons radially disposed around said housing and connected thereto, a centrally disposed stationary shaft supported in said housing to allow rotation thereabout having an eccentrically mounted yoke thereon to which a piston rod for each piston is connected relative to said cylinders such that rotation of said cylinders produces reciprocal movement of said cylinders with respect to said pistons, said shaft having a longitudinal bore therein connected to a fuel mixer and having orifices therein connecting said bore to a

tube in said housing terminating in a channelled ring surrounding and communicating with said orifices, said tube being aligned with a fuel entry port in said cylinder, said port alternately covered and uncovered by a sliding plate connected by a ball-joint to a piston rod for lateral reciprocal movement



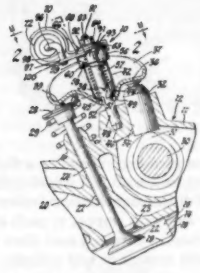
therewith, said port connecting said tube to channels in a cylinder wall which communicate with an interior of said cylinder through a plurality of orifices in said cylinder wall, such that a partial vacuum created by movement of said piston in said cylinder draws fuel through said bore, tube, port and channels into said cylinder.

4,249,488

VALVE LIFT ADJUSTING DEVICE

Donald C. Siegla, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 14, 1978, Ser. No. 942,349
Int. Cl.[3] F01L *13/00;* F02D *13/06*
U.S. Cl. 123—90.16 **2 Claims**



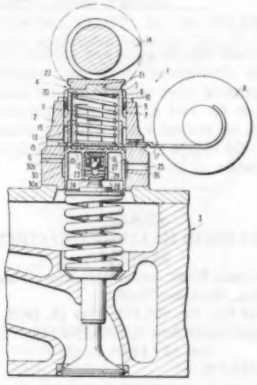
1. In a valve arrangement having a poppet valve biased to close by a spring and forced to open against the spring by a lever, a valve lift adjusting device for selectively establishing full valve lift and partial valve lift comprising fixed support means, fulcrum means providing a fulcrum for the lever slidable along said support means between a full-lift position where movement of the lever effects full valve lift and a partial-lift position where the valve opening movement of the lever is reduced to thereby effect a predetermined partial valve lift, means for preventing turning of said fulcrum means while permitting its sliding movement, stop means supported in a fixed position on said support means, said fulcrum means having projecting lift determining means for engaging said stop means to stop said fulcrum means in said partial-lift position, spring means for yieldingly resisting movement of said fulcrum means to its partial-lift position during valve opening and urging return of said fulcrum means to its full-lift position during valve closing, and selector means supported in a fixed position on said support means intermediate said fulcrum means and said stop means for selective movement to a full-lift selector position for engagement by said projecting lift determining means to stop said fulcrum means in its full-lift position and movement to a partial-lift selector position permitting said projecting lift determing means to project therepast to engage said stop means to stop said fulcrum means in its partial-lift position during valve opening.

4,249,489

MULTI-CYLINDER INTERNAL COMBUSTION ENGINE WITH A VALVE SHUTOFF

Werner Bruder, Remseck, and Roland Merkle, Stuttgart, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 20, 1979, Ser. No. 22,326
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1978, 2814096
Int. Cl.[3] F01L *13/00;* F02D *13/06*
U.S. Cl. 123—90.16 **23 Claims**



1. A multi-cylinder internal combustion engine which includes valve means for respective cylinders of the engine and means for selectively shutting off a valve means of at least one of the cylinders, the valve means including a valve stem and a valve actuating cam means, characterized in that means are interposed between an end of the valve stem and the valve actuating cam means for selectively directly rigidly mechanically connecting or disconnecting an end of the valve stem relative to the valve actuating cam means in dependence upon a positioning of the valve means.

4,249,490

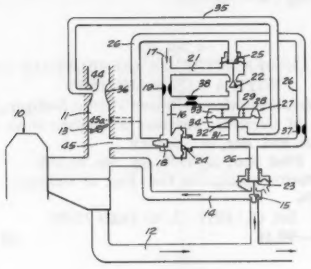
EXHAUST GAS RECIRCULATION FOR ENGINE

Toshio Shioya, Urawa; Kiyoshi Ishii, Tachikawa, and Hiroyuki Nishimura, Kounosu, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 17, 1979, Ser. No. 67,469
Claims priority, application Japan, Sep. 1, 1978, 53-106206
Int. Cl.[3] F02B *47/08*
U.S. Cl. 123—568 **7 Claims**

1. In an internal combustion engine having an intake passage for delivering an air-fuel mixture into the engine, a throttle valve in the intake passage, and an exhaust passage for carrying exhaust gases from the engine, the improvement comprising, in combination: a passageway connecting the exhaust passage to the intake passage downstream from the throttle valve for recirculating exhaust gases into said engine, an exhaust gas recirculation control valve in said passageway, an air conduit connecting said intake passage downstream from said throttle valve to atmosphere, an air control valve in said air conduit,

said air conduit having a restriction located between its opening to atmosphere and said air control valve, a bypass conduit connected to said air conduit upstream and downstream with respect to said restriction, a variable throttling valve in said bypass conduit, each of said three valves having a vacuum responsive actuator, a regulating valve responsive to differential pressure between vacuum pressure in said intake passage



upstream from said throttle valve and vacuum pressure in said bypass conduit downstream from said variable throttling valve, said regulating valve acting to control vacuum intensity in the actuators for said exhaust gas recirculation control valve, and said air control valve whereby exhaust gases are recirculated to the engine at a rate substantially in proportion to the rate of intake air to the engine.

4,249,491

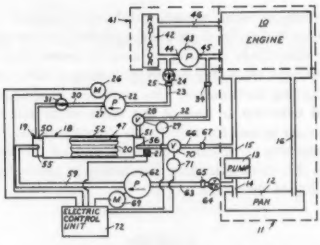
MULTIPLE LIQUID HEATING AND CIRCULATING SYSTEM

John Stein, Spokane, Wash., assignor to Kim Hotstart Manufacturing Co., Inc., Spokane, Wash.

Continuation of Ser. No. 907,271, May 18, 1978, abandoned. This application Sep. 4, 1979, Ser. No. 71,981

Int. Cl.³ F02N *17/02*

U.S. Cl. 123—142.5 R **4 Claims**



1. An apparatus adapted to maintain an engine in readiness for operation wherein the engine is of a type that includes a closed coolant recirculation system having a coolant supply and a coolant recirculating pump as well as a closed lubricant recirculation system having a lubricant supply and a lubricant recirculating pump; said apparatus comprising:

a coolant supply pump adapted to be mounted external to an engine, said coolant supply having an inlet and an outlet;

first conduit means for interconnecting the coolant supply of an engine to the inlet of said coolant supply pump;

a lubricant supply pump adapted to be mounted external to an engine, said lubricant supply pump having an inlet and an outlet;

second conduit means for interconnecting the lubricant supply of the engine to the inlet of said lubricant supply pump;

heat exchanger means for raising the temperature of liquid flowing therethrough to a constant predetermined temperature, substantially equal to the normal temperature of the coolant while the engine is operational;

said heat exchanger means having concentrically positioned separate coolant and lubricant chambers each having an inlet and an outlet;

means operatively connected between the outlet of the coolant supply pump and the inlet of the coolant chamber of said heat exchanger means for directing coolant under pressure to the heat exchanger means;

means operatively connected between the outlet of the lubricant supply pump and the inlet of the lubricant chamber of said heat exchanger means for directing lubricant to the heat exchanger means at a pressure substantially equal to the normal pressure of the lubricant in the lubricant recirculation system while the engine is operational;

third conduit means for interconnecting the outlet of the coolant chamber to the coolant recirculation system of an engine at a location downstream from its coolant recirculating pump;

and fourth conduit means for interconnecting the outlet of the lubricant chamber to the lubricant recirculation system of an engine at a location downstream from its lubricant recirculating pump.

4,249,492

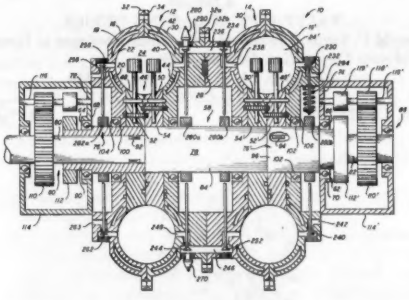
CONSTANT TORQUE ROTARY ENGINE

Gilbert H. Norris, R.F.D. No. 1, Cameron Rd., Mass.SCOT

Filed Oct. 10, 1978, Ser. No. 949,697

Int. Cl.³ F02B *53/00*

U.S. Cl. 123—234 **15 Claims**



1. A device for compressing/expanding a fluid comprising:

wall means defining at least one toroidal cylinder,

at least one pair of discs mounted for revolving with respect to said cylinder and with respect to each other,

a drive shaft mechanism carrying said discs such that said discs revolve with respect to said cylinder,

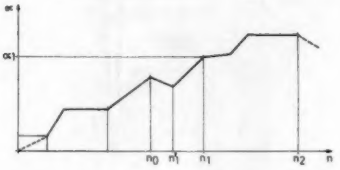
piston means cooperating to define a compressing/expanding chamber during revolution of said discs, said piston means including at least a cooperating pair of pistons, each of said pistons being mounted on a respective disc which revolves within said cylinder,

means for controlling the mode of operation of said pistons such that said pistons are selectively placed in a passing mode and a compression/expansion mode at predetermined times during the revolution of said piston means and said piston means being positionable in a passing mode such that at least one of said piston means can revolve past its cooperating piston means during revolution of said discs, and said pistons being positionable in a compression-/expansion mode such that the opposite end portions of the chamber defined between cooperating pairs of piston means are defined by said cooperating piston means, each piston means including a piston head proportioned for sealing the cross-section of said cylinder upon being positioned in said compression/expansion mode.

4,249,493
METHOD AND SYSTEM FOR GENERATING OPERATION-DEPENDENT CONTROL SIGNALS FOR APPARATUS, PARTICULARLY IGNITION AND FUEL INJECTIONS SYSTEMS FOR INTERNAL COMBUSTION ENGINES

Günter Honig, Markgromingen, and Heinz Moller, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 26, 1978, Ser. No. 909,745
Claims priority, application Fed. Rep. of Germany, May 24, 1977, 2723265
Int. Cl.³ F02P *5/04*
U.S. Cl. 123—416 **22 Claims**



1. In an internal combustion engine having a shaft rotating through sequential cycles each starting at a reference point, over a speed range corresponding to a predetermined range of engine speed, a system for generating a control signal at a control position relative to said reference point, said control position varying as a function of engine speed, comprising

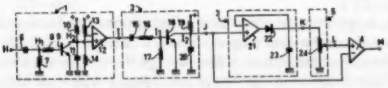
mark carrying means (1*a*, 1*b*, 1*c*) and mark sensing means (4) moving relative to each other at a speed corresponding to the then-present engine speed, said mark carrying means having a data storage region having data markings (20) representing, in a predetermined code, the values of constants required to compute said control position, said mark carrying means further comprising a sequence of counting markings (30) spaced at predetermined angular increments therealong, said mark sensing means comprising means for sensing said data markings and said counting markings and furnishing corresponding data and counting signals, respectively; and

computing means (10) connected to said mark sensing means for computing said control position at least in part as a function of said data signals and for generating said control signal when said shaft is in said control position relative to said reference point, said computing means comprising means for summing at least selected ones of said counting signals and said data signals and furnishing said control signal when the so-formed sum reaches a predetermined sum.

4,249,494
INTERNAL COMBUSTION ENGINE IGNITION SYSTEMS

Serge C. Guipaud, Saint-Papoul, France, assignor to Societe pour l'Equipement de Vehicules, Issy les Moulineaux, France

Filed Nov. 15, 1979, Ser. No. 94,674
Claims priority, application France, Nov. 24, 1978, 78 33294
Int. Cl.³ F02P *5/04*
U.S. Cl. 123—425 **8 Claims**

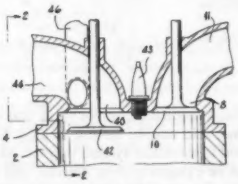


1. An electronic device to be associated with a periodic generator of ignition signals for an internal combustion engine, the ignition signal being shifted in each cycle relative to the top dead centre position of the piston on its compression stroke, by a value which varies as a function of the rotation speed of the engine, said device producing a periodic signal of which the beginning and the end are positioned in an essentially constant manner in each cycle, relative to the instant of the top dead centre position, with a predefined margin of error; wherein said electronic device comprises on the one hand at least one first stage means for generating a signal which is shifted by a constant interval relative to the signal which it receives, and on the other hand further stage means for generating a signal which is shifted relative to the signal which it receives, by an interval corresponding to a constant angle of rotation of the engine, these two types of stage being arranged in series in order to define at least one of the beginning and the end of the resulting said periodic signal.

4,249,495
INTERNAL COMBUSTION ENGINE AND HEAD THEREOF

John M. Trihey, Bayswater, Australia, assignor to Malz Nominees Pty. Ltd., Caulfield, Australia

Filed Dec. 19, 1977, Ser. No. 861,929
Claims priority, application Australia, Dec. 21, 1976, 8566/76
Int. Cl.³ F02B *15/00*
U.S. Cl. 123—432 **10 Claims**



1. An internal combustion engine comprising:

at least one cylinder;

a cylinder head having a combustion chamber formed therein, said chamber being shaped substantially as a surface of revolution with a substantially planar upper surface, said combustion chamber being free of projections beyond said substantially planar upper surface;

a piston reciprocable in the cylinder;

first inlet means for directing a first gas which contains fuel toward the center of the cylinder without a significant tangential component of velocity, the first inlet means including a substantially radially extending first duct which has a terminal portion which opens to said combustion chamber through an inlet valve and is generally parallel to the axis of the cylinder;

second inlet means for admitting a second gas which does not contain fuel or contains significantly less fuel than the first gas, said second inlet means including a second duct which is generally tangential to the cylinder and admits the second gas tangentially relative to the circumference of the cylinder, said second duct sloping downward in a chordal plane of the cylinder outboard of the stem and said inlet valve, said second duct ending at an opening in the upstanding, substantially circumferentially facing sidewall of said first duct, the axis of said second duct extending from said ending of said second duct at said opening at said downward slope relative to the stem of said inlet value in said chordal plane through said terminal portion of said first duct to angle down under the level of the radially extending part of said first duct and above the open position of the head of said valve, such that said first and second ducts direct their respective gas streams at respective angles downwardly in respective mutually substantially perpendicular planes each parallel to the cylinder axis, with said second gas stream crossing under said first gas stream, said second gas being confined gener-

ally adjacent to the cylinder wall whereby the circulating second gas remains substantially separated from the non-circulating first gas during compression of said first and second gases into the combustion chamber by said piston; and

an ignition device located generally centrally of the cylinder head and projecting into said combustion chamber so as to project into the compressed, non-circulating first gas on compression thereof by the piston.

4,249,496

AIR-FUEL RATIO FEEDBACK CONTROL APPARATUS OF AN INTERNAL COMBUSTION ENGINE

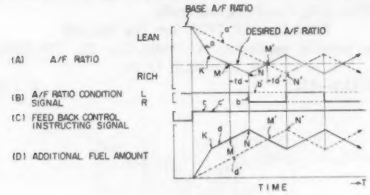
Ryuji Shimazaki, Susono, and Yoji Satoh, Nagoya, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Nippon Soken, Inc., both of Aichi, Japan

Filed Dec. 4, 1978, Ser. No. 965,848

Claims priority, application Japan, Dec. 12, 1977, 52-148208

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—438 **20 Claims**



1. An air-fuel ratio feedback control apparatus of an internal combustion engine, said engine having at least one fuel injection valve disposed in an intake system thereof, an air-fuel ratio sensor disposed in an exhaust system thereof, and an open-loop fuel control means for providing said engine with an air-fuel mixture having an air-fuel ratio on the lean side of a desired air-fuel ratio, said apparatus comprising:

a closed-loop fuel control means for increasing or decreasing at a predetermined rate an amount of additional fuel fed into said engine via said fuel injection valve for enriching said lean air-fuel mixture, in accordance with the level of an air-fuel ratio condition signal from said air-fuel ratio sensor; and,

an initial fuel control means for increasing the amount of additional fuel fed into said engine at a rate greater than the predetermined rate used in said closed-loop fuel control means, said initial fuel control means being operative only during a predetermined period following initiation of operation of said closed-loop fuel control means.

4,249,497

FUEL INJECTION APPARATUS HAVING AT LEAST ONE FUEL INJECTION VALVE FOR HIGH-POWERED ENGINES

Franz Eheim, and Max Straubel, both of Stuttgart, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 5, 1978, Ser. No. 966,541

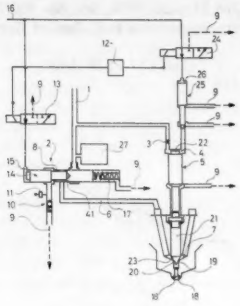
Claims priority, application Fed. Rep. of Germany, Dec. 31, 1977, 2759187

Int. Cl.³ F02M *47/02, 51/00*

U.S. Cl. 123—446 **20 Claims**

1. A fuel injection apparatus for high-powered engines or the like and including at least one fuel injection valve having a housing with a valve body axially displaceable within the housing, a pressure chamber connected via a connecting line with a fuel delivery line, the valve body having a first face projecting into said pressure chamber and provided with a needle valve cooperating with a valve seat and a second face which is subjected to fuel pressure at the direction of a control means so that the valve seat is sealed by means of the needle valve and is pressure relieved at said second face to effect injection, whereby the valve body with its needle valve is lifted from the valve seat via said first face oriented toward the needle valve which is subjected to the injection pressure, the improvement which comprises:

an obturation mechanism provided in said fuel delivery line leading to said pressure chamber, a return line connected with said obturation mechanism, said obturation mecha-



nism arranged to permit said connecting line leading to said pressure chamber to be selectively connected first with the fuel delivery line and then with said return line, and means for controlling said obturation mechanism in synchronism with the injection so that the connecting line between the pressure chamber and the fuel delivery line is interrupted at least during a large portion of the pause between injections and is opened for a period which is somewhat longer than the duration of injection.

4,249,498

APPARATUS FOR CORRECTING A FUEL APPORTIONMENT SIGNAL IN AN INTERNAL COMBUSTION ENGINE

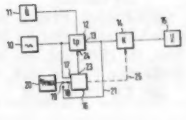
Ulrich Drews, Vaihingen-Pulverdingen; Hans Schnürle, Walheim, and Michael Horbelt, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 27, 1979, Ser. No. 24,490

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1978, 2815067

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—478 **8 Claims**



1. Apparatus for correcting a fuel apportionment signal in an internal combustion engine during a change in quantity comprising, in combination, a first storage device, means for charging said first storage device in accordance with rpm to provide a stored value, a second storage device for providing a periodic alteration signal, means including said stored value for determining the content of said second storage device during certain time intervals and according to a certain function and means

including the alteration signal of said second storage device for correcting the fuel apportionment signal.

4,249,499

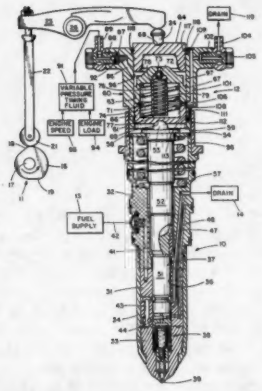
TIMING MECHANISM FOR A FUEL SUPPLY SYSTEM

Julius P. Perr, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Continuation of Ser. No. 974,566, Dec. 29, 1978, which is a continuation-in-part of Ser. No. 929,340, Jul. 31, 1978, abandoned, which is a continuation of Ser. No. 755,787, Dec. 30, 1976, abandoned. This application Jan. 21, 1980, Ser. No. 113,739

Int. Cl.³ F02M *39/02, 47/02;* F04B *49/08*

U.S. Cl. 123—502 **19 Claims**



15. Apparatus for varying the timing of injection of a fuel injector for an internal combustion engine, the injector including a movable plunger which is movable in an injection stroke and in a retraction stroke and is operable to inject fuel during the injection stroke, and the engine further including drive means for moving the plunger, comprising a housing having a bore formed therein, a first piston movable in said bore and connected to be moved by said drive means, a second piston in said bore and connected to move with said plunger, means for metering a volume of a timing fluid into said bore between said first and second pistons, said timing fluid volume forming a variable length hydraulic link between said first and second pistons, and pressure responsive means connected to said bore for releasing at least a portion of said timing fluid volume when the pressure thereon reaches a predetermined level during said injection stroke.

4,249,500

FLAPPER LINKAGE IN AIR INTAKE CONTROL SYSTEM OF INTERNAL COMBUSTION ENGINE

Bernhard Behrendt, Grossbottwar; Gerhard Brenner, Asperg; Heinz Fischer, Leonberg, and Rudolf Leipelt, Oberstenfeld, all of Fed. Rep. of Germany, assignors to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Fed. Rep. of Germany

Filed Feb. 6, 1979, Ser. No. 9,856

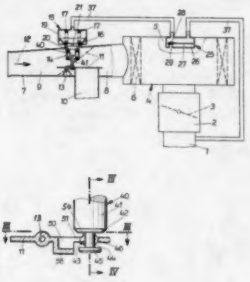
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1978, 7805694[U]

Int. Cl.³ F02M *31/00*

U.S. Cl. 123—556 **4 Claims**

1. A device for controlling the combustion air temperature in the air intake system of an internal combustion engine, comprising a pivotable flapper which serves as a flow proportioning valve at a duct junction between an intake duct for preheated raw air and an intake duct for raw air of ambient temperature, leading to a raw air mixing duct downstream of the duct junction, the flapper being operable to progressively open and close one of the two raw air intake ducts while correspondingly closing and opening the other, as a result of being connected to a flapper drive assembly which is capable of adjusting the angular position of the flapper in response to changes in the temperature of the combustion air which is taken in by the internal combustion engine, in such an air temperature controlling device, the improvement comprising:

as part of the flapper, a flapper pivot axis, a flapper wall of generally flat configuration extending parallel to the flapper pivot axis, and a connecting cylinder formed by protrusions of the flapper wall, the cylinder axis being parallel to the flapper pivot axis; and



as part of the flapper drive assembly, a drive member with a drive member extension whose axis is oriented transversely to the plane of the flapper wall and which has an end portion defining a recess with two oppositely facing positioning flanks oriented substantially perpendicularly to the axis of the drive member extension and engaging opposite sides of the connecting cylinder of the flapper, said engagement thereby allowing for lateral shifting of the connecting cylinder relative to the axis of the drive member extension, in order to accommodate arcuate displacements of the connecting cylinder about the flapper pivot axis in conjunction with substantially straight displacements of the flapper drive assembly.

4,249,501

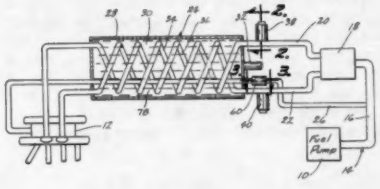
FUEL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Ewald Ehresmann, Manly, Iowa 50456

Filed Aug. 6, 1979, Ser. No. 64,051

Int. Cl.³ F02M *31/00*

U.S. Cl. 123—552 **10 Claims**



1. In the fuel system of an internal combustion engine including a fuel pump for supplying fuel to a carburetor through a fuel line, the improvement comprising,

heater means for heating said fuel line at a position intermediate said fuel pump and carburetor,

said fuel line including an air orifice at a position upstream of said heater means,

means for adjusting air flow through said orifice,

a bypass fuel line having one end in communication with said fuel line upstream of said air orifice and an opposite end in

communication with said carburetor for supplying fuel thereto, and

a thermally controlled valve interposed along said bypass fuel line, said thermally controlled valve being in thermal communication with said heater means so as to close when the temperature of said heater means is above a predetermined temperature and to open when the temperature of said heater means is below said predetermined temperature,

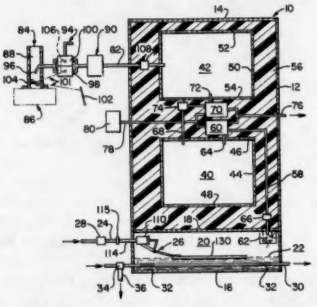
said valve including an orifice therethrough which is adapted to provide limited fuel flow through said valve in both the closed and open positions therefor.

4,249,502

METHOD AND APPARATUS FOR GENERATING AND DELIVERING GASEOUS FUEL VAPOR TO AN INTERNAL COMBUSTION ENGINE

David J. Hover, 1316 Kent Dr., Brunswick, Ohio 44212

Filed Jun. 4, 1979, Ser. No. 45,187
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—557 **15 Claims**



1. Liquid fuel vaporizing apparatus for an internal combustion engine having an air induction passage comprising, housing means having wall means providing a hermetically sealed enclosure, first and second hermetically sealed fuel vapor chambers in said enclosure, means providing a source of gaseous fuel vapor from a liquid fuel, first flow line means including first pump means in said enclosure for pumping fuel vapor from said source to said first chamber at a first pressure, second flow line means in said enclosure including second pump means for pumping fuel vapor from said first chamber to said second chamber at a second pressure higher than said first pressure, first check valve means in said first flow line means to prevent flow of vapor from said first chamber to said source, second check valve means in said second flow line means to prevent flow of vapor from said second chamber to said first chamber, third flow line means for connecting said second chamber with said air induction passage, and flow control means in said third flow line means and including flow control valve means for preventing unintended flow of vapor from said second chamber to said air induction passage.

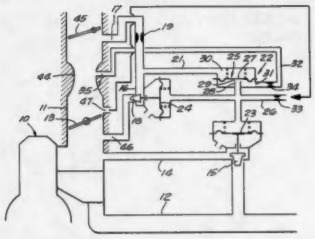
4,249,503

EXHAUST GAS RECIRCULATION FOR ENGINE

Takeshi Noguchi, Niiza; Hiroyuki Nishimura, Kounosu, and Takashi Umemoto, Niiza, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 27, 1979, Ser. No. 70,026
Claims priority, application Japan, Sep. 7, 1978, 53/109066
Int. Cl.³ F02B *47/08;* F02M *25/06*
U.S. Cl. 123—568 **1 Claim**

1. In an internal combustion engine having an intake passage for delivering an air-fuel mixture into the engine, a throttle valve in the intake passage, a choke valve in the intake passage, and an exhaust passage for carrying exhaust gases from the engine, the improvement comprising, in combination: a passageway connecting the exhaust passage to the intake passage downstream from the throttle valve for recirculating exhaust gases into said engine, an exhaust gas recirculation control valve in said passageway, an air conduit connecting said intake passage downstream from said throttle to the intake passage downstream of the choke valve, an air control valve in said air conduit, said air conduit having a restriction device located between its upper opening and said air control valve, a branch conduit connected to said air conduit between said restriction



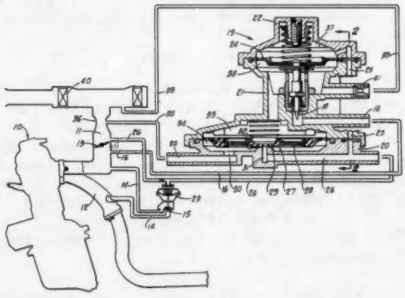
device and air control valve, a regulating valve in said branch conduit, each of said two control valves and said regulating valve having a vacuum responsive actuator, a vacuum line connected to said intake passage upstream from said throttle valve, said regulating valve responsive to differential pressure between vacuum pressure in said vacuum line and vacuum pressure in said air conduit, a control pipe system connecting said vacuum responsive actuators to said intake passage near said throttle valve, means whereby said regulating valve acts through said control pipe system to act upon vacuum responsive actuators for said control valves.

4,249,504

UNITARY ASSEMBLY FOR CONTROL OF EGR APPARATUS FOR ENGINE

Toshio Shioya, Urawa; Kiyoshi Ishii, Tachikawa, and Hiroyuki Nishimura, Kounosu, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 27, 1979, Ser. No. 70,027
Claims priority, application Japan, Sep. 14, 1978, 53/112186
Int. Cl.³ F02B *47/08;* F02M *25/06*
U.S. Cl. 123—568 **4 Claims**



1. In an internal combustion engine having an intake passage for delivering an air-fuel mixture into the engine, a throttle valve in the intake passage, and an exhaust passage for carrying exhaust gases from the engine, the improvement comprising, in combination: a passageway connecting the exhaust passage to the intake passage downstream from the throttle valve for recirculating exhaust gases into said engine, an exhaust recircu-

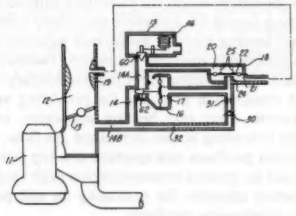
lation valve in said passageway and having a vacuum responsive actuator, a housing comprising a base, a body, and a cap, an air conduit connecting said intake passage downstream from said throttle valve to atmosphere, an air control valve positioned in said air conduit and having an actuator responsive to differential pressure, said air control valve being mounted in said body, a vacuum line connected to said intake passage upstream from said throttle valve, a regulating valve positioned in said base and having an actuator responsive to differential pressure between vacuum pressure in said vacuum line and vacuum pressure in said air conduit upstream from said air control valve, a control pipe system connected to said intake passage near said throttle valve, and means whereby said regulating valve functions through said control pipe system to act upon the vacuum responsive actuator for said exhaust recirculation valve and upon said actuator for said air control valve.

4,249,505

COMPENSATION SYSTEM FOR QUANTITY OF INTAKE AIR FOR AN INTERNAL COMBUSTION ENGINE

Hiroyuki Nishimura, Kounosu, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 29, 1979, Ser. No. 43,212
Claims priority, application Japan, Jun. 12, 1978, 53-69858
Int. Cl.³ F02M *23/08*
U.S. Cl. 123—587 **5 Claims**



1. Apparatus for controlling the quantity of intake air for an internal combustion engine comprising:

(a) a main air intake passage equipped with a carburetor having a throttle valve;

(b) a supplementary air intake passage connecting the main air intake passage on the downstream side of the throttle valve with the atmosphere;

(c) atmospheric pressure correction means in the supplementary air intake passage for varying the open cross-sectional area of the supplementary air passage in response to changes in atmospheric pressure; and

(d) means for controlling the open cross-sectional area of the supplementary air intake passage so as to pass an amount of air through the supplementary air intake passage proportional to the amount of air passed through the main air intake passage.

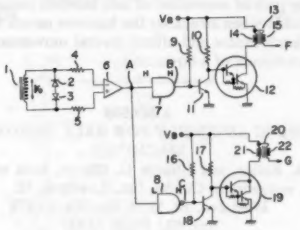
4,249,506

IGNITION DEVICE FOR INTERNAL COMBUSTION ENGINE

Yasuo Tada, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 12, 1979, Ser. No. 84,165
Claims priority, application Japan, Nov. 8, 1978, 53/153912[U]
Int. Cl.³ F02P *1/00*
U.S. Cl. 123—618 **1 Claim**

1. In an ignition device for an internal combustion engine, an improvement characterized in that two signal generator coils which correspond to ignition timing of an engine and which generate the output having steep variation from positive (or negative) peak value of the output wave to negative (or positive) peak value, are serially connected in reverse polarity, and the output terminals of the serially connected generator coils are connected in parallel to a circuit in which two serially connected rectifying elements in reverse polarity, and a joint between the two generator coils is connected to a joint between the two rectifying elements and the output terminals of two serially connected generator coils are respectively connected to two input terminals of the differential amplifying circuit whereby the output of the differential amplifying circuit is given as the input signal for the ignition circuit.

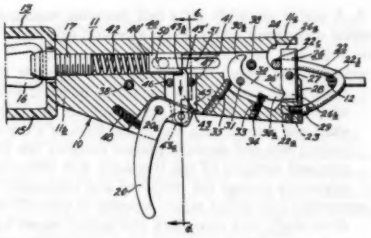


4,249,507

POWER BOWSTRING RELEASE DEVICE

Paul Marra, 8 Eventide Pl., Levittown, Pa. 19054

Filed Mar. 14, 1979, Ser. No. 20,350
Int. Cl.³ F41B *5/00*
U.S. Cl. 124—35 A **10 Claims**



1. Bowstring draw and release apparatus comprising:

elongated frame means having a front end adapted to be positioned adjacent a bowstring and a rear end,

hand grip means extending from said rear end and adapted to be gripped by a user's hand,

a loop mounted at the front end of said frame and adapted to be formed into a bight around a bowstring,

means providing a recess in said front end for receiving said loop after having been formed into said bight,

latch means mounted in said frame to pivot from a latched position wherein one portion extends through said loop across said recess to an unlatched position alongside the recess for affording off-slipping of the loop from the latch thereby to release a bowstring,

hammer means mounted in said frame for movement longitudinally from a cocked position adjacent the rear end of the frame into an operative position toward the front end of the frame,

means for driving said hammer means toward the front end of the frame,

cocking means for displacing said hammer means against its driving means into said cocked position,

hammer sear means releasably engaging said hammer means for releasably retaining it in said cocked position,

trigger means extending laterally of said frame in front of said hand grip means so as to be engageable by the user's

index finger for cooperating with said hammer sear means to disengage the same from said hammer means upon displacement of said trigger means, and

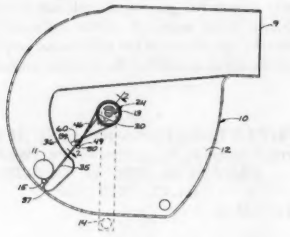
latch sear means for releasably retaining the latch means in its latched position and having an upper portion disposed in the path of movement of said hammer means so as to be operable when struck by the hammer means to disengage the latch means and afford pivotal movement thereof to effect release of a bowstring.

4,249,508

SPRING ASSEMBLY FOR BALL THROWING MACHINES

Harold A. Keller, and Clinton G. Glover, both of Clarkston, Wash., assignors to Cytron, Inc., Lewiston, Id.

Filed Jun. 18, 1979, Ser. No. 49,478
Int. Cl.³ F41D *11/00*
U.S. Cl. 124—80 **14 Claims**



1. A spring assembly for a ball throwing machine having a central drive shaft rotatable on a central axis and a throwing arm abutment, the spring assembly comprising:

primary coil spring means adapted to encircle the central drive shaft, said primary coil spring means having one end adapted to be operably connected to the central drive shaft and a remaining end in the form of a throwing arm having first and second opposed surfaces, the first of said opposed surfaces of the throwing arm being adapted to releasably engage the throwing arm abutment;

secondary coil spring means adapted to encircle the central drive shaft, said secondary coil spring means having one end adapted to be operably connected to the central drive shaft and a remaining end extending outward therefrom for engaging the second of said opposed surfaces of the throwing arm;

the secondary coil spring means being adapted to load and unload in unison with the primary coil spring means; and

energy absorbing means adapted to encircle the central drive shaft, said energy absorbing means having one end adapted to be operable connected to the central drive shaft and a remaining end extending outward therefrom for engaging the first of said opposed surfaces of the throwing arm for limiting stress reversal in the primary and secondary coil spring means by loading against the throwing arm in response to unloading of the primary and secondary coil spring means.

4,249,509

WOOD BURNING APPARATUS HAVING IMPROVED EFFICIENCY

Duncan C. Syme, Chelsea, Vt., assignor to Vermont Castings, Inc., Randolph, Vt.

Filed Mar. 9, 1978, Ser. No. 884,998
Int. Cl.³ F24C *1/14*
U.S. Cl. 126—77 **15 Claims**

1. A heating apparatus comprising

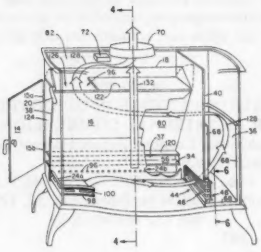
a heat conducting frame member enclosing a primary combustion chamber, and

a secondary combustion chamber in gaseous communication with said primary combustion chamber,

a baffle for separating said primary and secondary combustion chambers, said baffle having an opening connecting said primary and secondary combustion chambers for providing said gaseous communication therebetween,

a first air supply means for providing air for promoting combustion in said primary combustion chamber,

air mixing means for promoting a uniform turbulent mixing of air with combustion products from said primary combustion chamber to provide a mixed gas flow,



a second air supply means for providing sufficient air to said air mixing means for complete secondary combustion,

an electric heating member positioned adjacent said mixing means selectively operable for heating the mixed gas flow from said mixing means to promote secondary combustion of said combustion products for providing an increased heat output from said heating apparatus, said heating member extending across the mixed gas flow, and

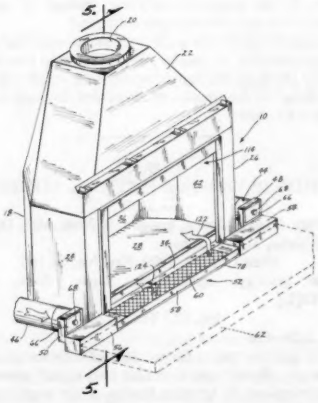
a combustion products exit aperture at a top portion of said frame and in gaseous communication with said secondary combustion chamber for providing an exit port for secondary combustion products.

4,249,510

HEARTH VENTILATORS FOR DOMESTIC FIREPLACES

Billy B. Anderson, Burlington, Iowa, assignor to Vega Industries, Inc., Des Moines, Iowa

Filed Jun. 25, 1979, Ser. No. 51,525
Int. Cl.³ F24B *3/00*
U.S. Cl. 126—121 **10 Claims**



1. An improved system for providing a supply of air to a fireplace for supporting combustion in the firebox thereof and

for cooling the walls of the fireplace from a source outside the space wherein the fireplace is installed said fireplace comprising a firebox having a hearth floor, a rear wall, opposite side walls, and a front firebox opening, said fireplace having an outer housing surrounding said firebox in spaced relationship so as to form air passageways between said outer housing and each said wall and hearth of said firebox, said passageways including a front passageway opening adjacent the front edge of said hearth, said improved system, comprising:

(a) at least one elongated duct extending from communication at one end with the outside air source to a position laterally adjacent the fireplace;

(b) an air manifold extending horizontally substantially fully across the front of the fireplace, closely adjacent and in front of the lower, front edge of the firebox;

(c) communication means through which the outside air passes from said duct into said manifold; and

(d) means defining an elongated opening fully across the front of the fireplace through which the interior of said manifold communicates with the space immediately below and in front of the firebox, whereby outside air from said manifold is drawn into the firebox to support combustion, and to pass cool air beneath the hearth and to the walls of the fireplace to cool said walls,

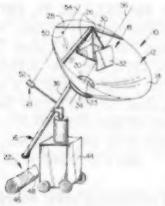
(e) a horizontal baffle means within said manifold for dividing the air into an upper layer directed towards the interior of said firebox through said front firebox opening thereof for supporting combustion, and a lower layer directed toward said front passageway opening for providing cooling air to said passageways to cool said walls of said firebox and to provide air to said firebox for combustion.

4,249,511

SOLAR GRILLE

Raymond J. Krisst, 93 Meadow Brook Rd., West Hartford, Conn. 06107, and Frank Krisciokaitis, 20 Woodmere Rd., West Hartford, Conn. 06119

Filed Aug. 9, 1978, Ser. No. 932,366
Int. Cl.[3] F24J *3/02*
U.S. Cl. 126—424 **15 Claims**



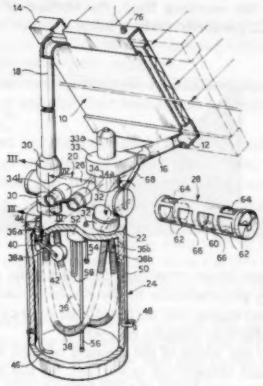
1. A solar grille comprising a collector having a generally parabolic reflecting surface, means supporting said collector for selective angular movement about a horizontal axis to position said collector relative to the surface of the earth to receive and reflect solar radiation, a generally horizontally disposed grille element, and pendulant supporting means mounting said grille element on said collector for maintaining said grille element in a gravity biased horizontally disposed position generally within the focal region of said collector when the collector is positioned in various selected angular positions relative to the surface of the earth.

4,249,512

SOLAR AIR AND WATER HEATER

Enrico Rivetti, Turin, and Filippo Audisio, Cambiano, both of Italy, assignors to Centro Ricerche Fiat S.p.A., Turin, Italy

Filed Jun. 20, 1979, Ser. No. 50,285
Int. Cl.[3] F24J *3/02*
U.S. Cl. 126—435 **6 Claims**



1. A solar air and water heater comprising in combination:

at least one solar energy collector which is to be crossed by a forced air flow, said solar energy collector having an air inlet manifold and an air outlet manifold,

a thermically isolated container provided with a covering lid,

means for feeding water into a lower portion of the container and for draining water from an upper portion of the container,

valve means operated by a float and disposed within said water feeding means for maintaining a predetermined level of water within the container,

an air flow control device supported by said covering lid,

an air inlet pipe and an air outlet pipe which connected, respectively, the air inlet manifold and the air outlet manifold of said solar energy collector to said air flow control device, said solar energy collector being supported by said air flow control device by means of said pipes,

an electrically driven fan for feeding a forced air flow into said air inlet pipe,

heat exchange means within said container, including air inlet means and air outlet means which are connected to said air flow control device,

a main air inlet conduit and a main air outlet conduit which are connected to said air flow control device,

distributing means within said air flow control device to connect said air inlet pipe and said air outlet pipe of the solar energy collector respectively to said air outlet means and to said air inlet means and/or respectively to said main air inlet conduit and to said main outlet conduit.

4,249,513

SOLAR COLLECTOR

Israel Dostrovsky, Rehovot, Israel, assignor to Yeda Research and Development Co. Ltd., Rehovot, Israel

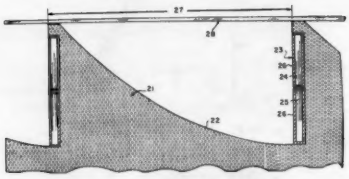
Filed Oct. 7, 1977, Ser. No. 840,379
Claims priority, application Israel, Oct. 10, 1976, 50603
Int. Cl.[3] F24J *3/02*
U.S. Cl. 126—438 **9 Claims**

1. A solar collector for heating a working fluid to a predetermined temperature above the boiling point of water, comprising:

a plurality of collector units each having a body of rigid thermally insulating material having a surface in the shape

of about half a cylindrical parabola, said units being spaced closely adjacent to one another, the parabolic surface of each said unit being provided with a reflective surface;

a conduit being positioned in each said unit facing the parabolic surface and positioned with its long axis in the median plane of the parabola, said conduit serving as a conduit for the working fluid, the surface of said conduit facing the parabolic surface being a selective surface;



a transparent cover provided over the units and disposed generally perpendicular to the planes of said conduits;

means for arranging said units with the long cylindrical axes of the reflectors running east-west;

the ratio of the width of the opening of each said unit over which said transparent cover lies, to the height of the selective surface being at least 1.5 to 1; and

means for disposing said units at an angle tilted south such that when the sun is at its maximum altitude its rays are substantially normal to the plane of said transparent cover.

4,249,514

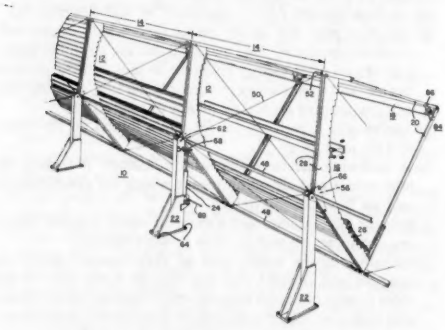
TRACKING SOLAR ENERGY CONCENTRATOR

Andrew R. Jones, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 9, 1978, Ser. No. 884,887

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—438 **9 Claims**



1. A solar energy concentrator comprising:

a. an elongated absorber;

b. an elongated reflector assembly having a plurality of curved mirror slats arranged in an arcuate orientation of radius R, each said curved slat being arcuate of radius 2R;

c. structure for supporting said absorber in a fixed position relative to said reflector assembly at about the center of curvature of said arcuate orientation; and

d. structure for reciprocatingly rotating said reflector assembly and affixed receiver through a predetermined angular rotation, said structure including a rectilinearly reciprocable jack member supported on a trunnion, said trunnion having a fixed pivot cooperatively associated with said reflector assembly, said reflector and jack member being joined by a moving pivot which rotates about said fixed pivot upon extension and retraction of said jack member, said fixed pivot being positioned behind said mirror slats.

4,249,515

HEATING APPARATUS

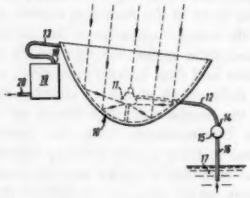
Victor J. Page, Hunter's Lodge, 47 Westmeston Ave., Saltdean, Sussex, England

Filed Aug. 11, 1978, Ser. No. 932,943

Claims priority, application United Kingdom, Aug. 12, 1977, 34050/77

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—438 **5 Claims**



1. A solar energy heating apparatus comprising a reflector for concentrating incident solar energy on a surface thereof to an absorption station, said reflector having a conduit arranged along a surface of said reflector for heating a fluid in said conduit;

an absorber located at substantially the absorption station associated with said reflector, said absorber comprising a housing having a cylindrical end facing away from said reflector, the surface of said housing extending outwardly from said end toward said reflector along an outside radius and thence inwardly along a smaller radius and thence outwardly away from said reflector to form first and second bulbous portions, said housing having at least first and second openings for receiving and delivering a fluid from said conduit; and

means for connecting said conduit to one of said openings whereby fluid flowing through said absorber and said conduit is heated from the heat generated along said reflector and at said absorption station.

4,249,516

SOLAR ENERGY COLLECTION

Virgil Stark, New York, N.Y., assignor to North American Utility Construction Corp., New York, N.Y.

Division of Ser. No. 845,862, Oct. 31, 1977, Pat. No. 4,194,949, which is a continuation-in-part of Ser. No. 810,761, Jun. 30, 1977, abandoned, Ser. No. 807,513, Jun. 20, 1977, and Ser. No. 806,291, Jun. 15, 1977, Pat. No. 4,210,121, said Ser. No. 810,761, and Ser. No. 807,513, each is a continuation-in-part of Ser. No. 806,291, Jun. 15, 1977, said Ser. No. 810,761, is a continuation-in-part of Ser. No. 807,513, Jun. 20, 1977. This application Jan. 24, 1979, Ser. No. 6,165

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—439 **4 Claims**

1. Apparatus for collecting solar energy comprising:

an elongated collector which includes at least one conduit therein adapted to pass at least one fluid therethrough, said collector, conduit and fluid being adapted to convert solar energy to heat energy said fluid,

a first elongated reflector disposed above the elongated collector,

a second elongated reflector disposed adjacent one side of the elongated collector,

a third elongated reflector disposed adjacent the other side of the elongated collector,

elongated Fresnel lens means for concentrating solar energy in an elongated focus, the Fresnel lens means being disposed between the first reflector and the collector,

the longitudinal axes of the first, second and third reflectors, the collector and the Fresnel lens means extending generally parallel,

the first, second and third elongated reflectors being concentrating reflectors each having an elongated focus,

the first, second and third reflectors being configured and positioned so that substantially all of the solar energy impinging on the second and third reflectors is reflected to the first reflector, and the Fresnel lens means being positioned to receive the reflected solar energy from the first reflector and concentrate it in the elongated focus along the elongated collector,

means for interconnecting said reflectors, lens means and collector and pivoting them as a unit aboutone of the longitudinal axes of said first reflector, said lens means and said collector, whereby the sun may be tracked.

2. Apparatus for collecting solar energy comprising:

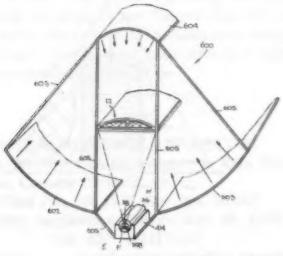
an elongated collector which includes at least one conduit therein adapted to pass at least one fluid therethrough,

a plurality of photovoltaic cells disposed in said conduit, said collector and cells being operative to convert solar energy to electricity in said cells,

a first elongated reflector disposed above the elongated collector,

a second elongated reflector disposed adjacent one side of the elongated collector,

a third elongated reflector disposed adjacent the other side of the elongated collector,



elongated fluid lens means for concentrating solar energy in an elongated focus, the fluid lens means being disposed above the collector between the first reflector and the collector,

the longitudinal axes of the first, second and third reflectors, the collector and the fluid lens means extending generally parallel,

the first, second and third elongated reflectors being concentrating reflectors each having an elongated focus,

the first, second and third reflectors being configured and positioned so that substantially all of the solar energy impinging on the second and third reflectors is reflected to the first reflector, and the fluid lens means being positioned to receive the reflected solar energy from the first reflector and concentrate it in the elongated focus extending along the elongated collector,

means for interconnecting said reflectors, lens means and collector and pivoting them as a unit about one of the longitudinal axes of said first reflector, said lens means and said collector, whereby the sun may be tracked,

said fluid lens means including a fluid characterized by substantially undiminished transmission therethrough of luminous rays and high absorption of infrared rays and including opposed plates enclosing said fluid, whereby conversion of solar energy to heat energy proximate the photovoltaic means is reduced and the efficiency of the production of electricity by the photovoltaic means is increased.

4. Apparatus for collecting solar energy comprising:

an elongated collector which includes at least one conduit therein adapted to pass at least one fluid therethrough, said collector, conduit and fluid being adapted to convert solar energy to heat energy to heat said fluid,

a first elongated reflector disposed above the elongated collector,

a second elongated reflector disposed adjacent one side of the elongated collector,

a third elongated reflector disposed adjacent the other side of the elongated collector,

elongated fluid lens means for concentrating solar energy in an elongated focus, the fluid lens means being disposed between the first reflector and the collector,

the longitudinal axes of the first, second and third reflectors, the collector and the fluid lens means extending generally parallel,

the first, second and third elongated reflectors being cncentrating reflectors each having an elongated focus,

the first, second and third reflectors being configured and positioned so that substantially all of the solar energy impinging on the second and third reflectors is reflected to the first reflector, and the fluid lens means being positioned to receive the reflected solar energy from the first reflector and concentrate it in the elongated focus along the elongated collector,

means for interconnecting said reflectors, lens means and collector and pivoting them as a unit about one of the longitudinal axes of said first reflector, said lens means and said collector, whereby the sun may be tracked.

4,249,517

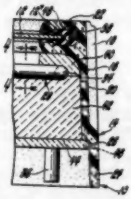
COMPOSITE MOLDED ARTICLE AND METHOD OF MAKING THE SAME

Lawrence E. Schroeder, Getzville, and Carlton M. Burgess, Lockport, both of N.Y.

Continuation-in-part of Ser. No. 805,412, Jun. 10, 1977, abandoned. This application Feb. 13, 1978, Ser. No. 877,188

Int. Cl.³ F24J 3/02

U.S. Cl. 126—450 **6 Claims**



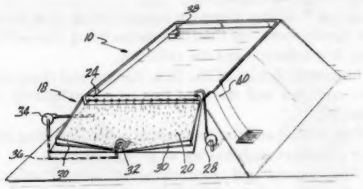
5. A molded solar heat collector including a composite molded member, comprising, a glass panel, an extruded generally U-shaped elastomeric packing strip mounted with its legs embracing the edge portion of said glass panel, a perimeter frame of polyurethane material mold-formed about said packing strip and glass edge portion, the legs of said strip being of a medium to medium-firm durometer elastomer and completely intervening said frame and the glass panel throughout the perimeter of said frame, and said strip having extruded therein a longitudinal cavity outboard of the terminal edge of said glass panel enabling relative movement between the latter and said frame in the plane of said glass panel without substantial force as during post-mold shrinkage of said frame or differential linear expansion thereof relative to said glass panel during use of the collector, said frame including an enclosing wall portion extending generally normal to the plane of said glass panel, a heat collecting panel mounted within said wall portion adjacent to and below said glass panel and including conduit means through which fluid may be made to flow, and thermal insulation means within said wall portion.

4,249,518

METHOD FOR MAINTAINING A CORRECT DENSITY GRADIENT IN A NON-CONVECTING SOLAR POND

Rush D. Holt, 5440 Mosholu Ave., Riverdale, N.Y. 10471

Filed Oct. 22, 1979, Ser. No. 86,769
Int. Cl.³ F23J *3/02*
U.S. Cl. 126—415 **12 Claims**



1. A method for automatically controlling the salt gradient region in a non-convecting salt gradient pond comprising the steps of:

A. providing a solar pond having an upper fresh water region, an intermediate salt gradient region and a lower heat storage region;

B. automatically removing salty water from a first level of said lower heat storage region of said solar pond in response to a sensed ambient condition;

C. feeding said removed salty water to a spillway where said water is exposed to sun and air;

D. evaporating said saltly water by said sun and air on said spillway so as to form a concentrated brine;

E. collecting said concentrated brine from said spillway; and

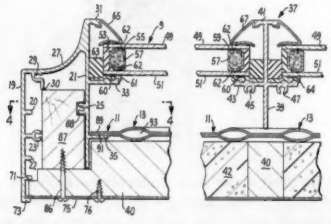
F. automatically returning said collected concentrated brine to a second level of said solar pond above said first level.

4,249,519

SOLAR COLLECTOR

Marco A. Martinez, 40 Eileen St., Watsonville, Calif. 95076

Filed Apr. 16, 1979, Ser. No. 30,534
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—450 **7 Claims**



1. A solar collecor comprising in combination:

a. a generally flat absorber plate, said plate being formed of two bonded sheets of condutive metal with a sinuous fluid passage formed between portions thereof with flat portions between said passages;

b. a double glazing of two sheets of glass over said plate to form a dead air space between said sheets and between said sheets and said flat plate, whereby a fluid such as water or air can flow into said passage at one end of said plate, through the entire length of said sinuous passage and out the other end of said plate;

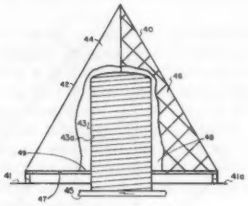
c. a frame made by combining metal extruded members with wood members surrounding said plate and extending above said plate, said metal exturded frame is provided with inwardly extending ledges including a first ledge to hold the flat plate, a second ledge to hold the bottom sheet of the glazing, a spacer (63) surrounding said glazing to hold said glazing and permit expansion and contraction and a top ledge spaced from the top of the top sheet, and a spring clip sprung between said top sheet and said ledge to provide a substantially weatherproof connection at the top of the collector, wherein said metal extruded frame having an outer wall and an inner wall, said wall being parallel to each other and spaced apart, said walls being connected together by a sloping top wall, sloping upward from the outer wall to the inner wall, and each wall having inwardly extending projections and a wooden frame member within said walls, said wooden member having a groove therein whereby said inner wall with the projection from the inner wall lying in said groove and said wooden member being held in spaced relationship to the top wall and the outer wall by the respective projections in said top and outside walls.

4,249,520

PYRAMIDAL ENERGY COLLECTOR SYSTEM

Alfred G. Orillion, 1201-E Cleermont Cir., Huntsville, Ala. 35801

Continuation-in-part of Ser. No. 800,745, May 26, 1977, Pat. No. 4,132,221. This application Dec. 26, 1978, Ser. No. 972,893
The portion of the term of this patent subsequent to Jan. 2, 1996, has been disclaimed.
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—439 **2 Claims**



1. An energy collector comprising:

a base and a pyramidal-shaped structure extending around and upward from said base;

a wall region of said structure extending approximately one-half way around said base, and said wall region extending upward linearly at an angle of less than 90° with respect to said base;

said base and said wall region having a radiant energy reflective inner side, and approximately the remainder of the way around said structure being radiant energy transmissive; and

an energy absorber comprising a circular spiral of tubing rising above the base and positioned centrally with respect to said structure, and said absorber being positioned and configured to:

directly receive a portion of the radiation passing through the transmissive remainder of said structure,

receive some radiation via a path through said transmissive remainder onto said reflective side of said structure and then reflected onto said absorber,

receive some radiation via a path through said transmissive remainder of said structure onto said base reflective inner side and then reflected onto said absorber, and

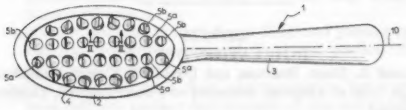
to receive some radiation via a path through said transmissive remainder of said structure that includes both said base reflective inner side and said reflective side of said structure;

whereby a substantial amount of all of the radiant energy passing through said transmissive remainder of said structure would be captured by the absorber, thereby effectively heating fluid directed through said tubing.

4,249,521
IMPLEMENT FOR MASSAGING THE CUTANEOUS COVERING

Jean-Louis H. Gueret, Paris, France, assignor to L'Oreal, Paris, France

Filed Apr. 23, 1979, Ser. No. 32,685
Claims priority, application France, Apr. 24, 1978, 78 12063; Dec. 6, 1978, 78 34330; Dec. 6, 1978, 78 34331
Int. Cl.[3] A61H 7/00
U.S. Cl. 128—62 R 19 Claims

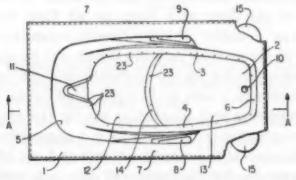


1. An implement for massaging the cutaneous covering comprising, at least one active face having a plurality of projecting pad means for contact with the skin, said pad means each being formed from a resiliently deformable flexible material, characterized by the fact that each pad means extends along a mean line and is comprised of portions which are alternately convex with respect to movement of the implement across the skin in one direction and concave with respect to movement of the implement in the opposite direction, each of said pad means presenting a resistance to bending when acting on its convex portion which is higher than the resistance to bending when acting on its concave portion, and wherein said pad means comprise spaced apart fingers disposed in substantially parallel rows, the fingers of the same row being substantially identical and oriented with their convex portions facing alternately in opposite direction.

4,249,522
HYDROMASSAGE APPARATUS

Roger Carrier, Ste-Foy, Canada, assignor to Bain Ultra Quebec Inc., Quebec, Canada

Filed Jun. 19, 1979, Ser. No. 50,040
Claims priority, application Canada, Jun. 20, 1978, 305870
Int. Cl.[3] A61H 9/00
U.S. Cl. 128—66 8 Claims

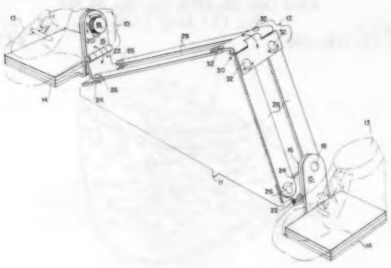


1. A hydromassaging apparatus comprising in combination a tub having a two-level bottom wall defined by two successive essentially flat surfaces interconnected to one another by a transverse ramp of limited extent, a front inclined wall having a shallow depression centrally thereof, an essentially vertically extending end wall and two lateral walls extending essentially vertically, compressed air supply means located adjacent said tub, longitudinally extending air distribution duct means secured to the outside surface of said tub peripherally thereof along the base of said front wall, end wall and lateral walls, said duct means also comprising air distribution branches disposed immediately adjacent said transverse ramp, and a plurality of small apertures extending through said tub from said air distribution ducts means, said apertures being evenly spaced apart along the base of said lateral walls there being at least two such apertures at spaced apart locations in said ramp, said air distribution duct means also comprising extensions behind the base of said front wall leading to apertures disposed at spaced apart locations of said shallow depression toward the base thereof.

4,249,523
ADJUSTABLE ORTHOPEDIC FOOT SPLINT

Robert E. Bidwell, Melville, N.Y., assignor to BioResearch Inc., Farmingdale, N.Y.

Filed May 7, 1979, Ser. No. 36,751
Int. Cl.[3] A61F 3/00
U.S. Cl. 128—80 A 23 Claims

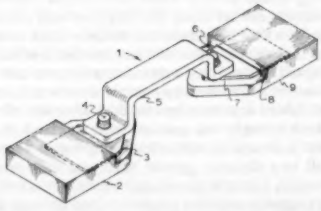


1. An orthopedic foot splint comprising:
a pair of shoe engaging plates;
linkage means interconnecting said pair of shoe engaging plates;
horizontally extending plate pivot means interconnecting each end of said linkage means with one of said pair of shoe engaging plates;
said linkage means including two pairs of parallelogram links having a central horizontally extending interconnecting pivot means;
whereby each of said shoe engaging plates are prevented from any relative rotation about a vertical axis with respect to each other so that the shoes of a patient are fixed in a selected angular relationship to each other, but permitting freedom of movement of shoes of a patient about axes other than the vertical axis.

4,249,524
KNEE STABILIZER

George C. Anderson, 2883 Doidge Ave., Pinole, Calif. 94564

Continuation of Ser. No. 919,870, Jun. 28, 1978, abandoned. This application Feb. 26, 1980, Ser. No. 124,862
Int. Cl.[3] A61F 3/00
U.S. Cl. 128—80 C 7 Claims



1. A knee stabilizer for support and protection of a knee joint consisting of:
(a) a rigid support bar having a raised center portion, an upper end and a lower end;
(b) an upper padded plate non slidably pivotally hinged to said upper end of said support bar;

(c) a lower padded plate pivotally hinged to said lower end of said support bar; and

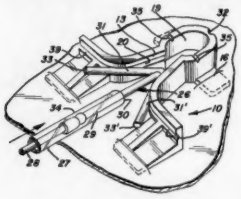
(d) upper securing means for removably securing said upper padded plate to the upper leg above the knee joint and lower securing means for removably securing said lower padded plate to the lower leg below the knee joint.

4,249,525

INSTRUMENT FOR LOADING AN INTRAUTERINE DEVICE INTO AN INSERTION TUBE

Melvin L. Krzeminski, Palatine, Ill., assignor to G. D. Searle & Co., Del.

Filed Oct. 15, 1979, Ser. No. 84,702
Int. Cl.³ A61F 5/46
U.S. Cl. 128—130 **4 Claims**



1. Adapted for use with a T-shaped intrauterine device having a stem member and flexible arm members integrally attached to and depending generally outwardly from one end of said stem member and a hollow tube carrying said T-shaped device in one end thereof, said stem member being mounted in said end of said tube and said arm members seated on said end of said tube and extending outwardly therefrom, an instrument for folding said arm members toward said stem member and loading said stem member and folded arm members into said end of said tube so that the free ends of said folded arm members are encompassed by said tube and a predetermined length of said stem member and foled arm members protrudes therefrom, said instrument comprising:

a body having a channel having opposing side walls and a back wall therebetween and being so formed in said body as to be adapted to receive said end of said tube carrying said T-shaped device when said tube is introduced lengthwise and with said end frontwise into said channel between said opposing side walls and toward said back wall of said channel, said channel tapering toward said back wall so that said opposing side walls are adapted to exert force on said arm members as said end of said tube carrying said device approaches said back wall such that the free ends of said arm members are fully folded when said device carried in said tube is brought to abutment with said back wall;

means adapted for guiding said arm members as they are being folded so that when fully folded both of said arm members extend along the length of said stem member;

means at a first predetermind distance from said back wall; less than the length of said arm members, which means are adapted for applying a restraining force to said folded arm members and to thereby restrain thereat said stem member and folded arm members so that, after said device in said tube is brought into contact with said back wall and said tube is thereafter withdrawn lengthwise from said backwall to a distance greater than said first predetermined distance, a length of said stem member and said arm members equal to said first predetermined distance is restrained between said restraining means and said backwall;

means adapted for reducing the force applied by said restraining means so that said tube and said device carried in said tube can be brought past said first predetermined distance toward said back wall; and

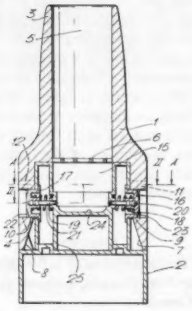
means adapted for biasing said fully folded arms so that, after said device in said tube is brought into contact with said back wall and thereafter said tube is withdrawn lengthwise from said back wall to a distance therefrom greater than the length of said arm members, said free ends are directed towards each other to a sufficient extent to be encompassed by said tube when said tube is next moved lengthwise towards the back wall to a second predetermined distance threfrom, less than said first predetermined distance, leaving a predetermined length of said stem member and arm members protruding from said end of said tube, said predetermined length being equal to said second predetermined distance.

4,249,526

INHALATION DEVICE

Desmond A. Dean, Beeston, and David M. Young, Loughborough, both of England, assignors to Fisons Limited, London, England

Filed Apr. 12, 1979, Ser. No. 29,318
Claims priority, application United Kingdom, May 3, 1978, 17418/78
Int. Cl.³ A61M 15/06
U.S. Cl. 128—203.15 **5 Claims**



1. An inhalation device for powdered medicaments contained initially in a container, which device comprises first and second housing members attachable one to the other by relative longitudinal movement therebetween to form a body defining an air flow path from an air flow inlet provided therein to an air outlet provided therein, means for locating the container in the air flow path in a position to be opened, appropriate opening means for the container provided on one of said housing members, a cam surface provided on the other of said housing members and adapted to act on the opening means, said opening means being normally in a non-container opening position but movable successively into and out of a container opening position by the action of the cam surface thereon occasioned by the longitudinal movement between the housing members, the cam surface including a step or steps to prevent reverse movement thereof when the opening means is in the non-container opening position after passing through the container opening position.

4,249,527

CONTINUOUS POSITIVE AIRWAY PRESSURE ADMINISTRATING APPARATUS

Wen H. Ko; David G. Fleming, both of Cleveland Hts.; Harry J. Derda, Beachwood, and William O. Martin, Chesterland, both of Ohio, assignors to Case Western Reserve University, Cleveland, Ohio

Continuation of Ser. No. 782,222, Mar. 28, 1977, abandoned. This application Feb. 9, 1979, Ser. No. 10,735
Int. Cl.³ A61M 16/00
U.S. Cl. 128—204.18 **10 Claims**

1. In a system for administering gas at an elevated pressure to

a patient requiring respiratory support, the improvement comprising:

generally annular inner wall means defining a central fluid exhaust passage;

said inner wall means including a distal end portion adapted to be disposed adjacent to a patient's breathing passage;

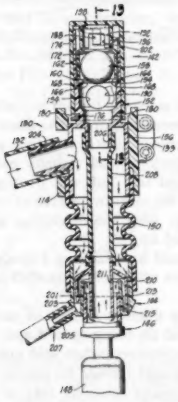
means establishing fluid communication between said central fluid exhaust passage and the atmosphere for carrying gas exhaled by a patient away from said system;

generally annular outer wall means spaced from and extending around said inner wall means to define a generally annular fluid delivery passage between said inner and outer wall means;

said outer wall means including a distal end portion spaced radially-outwardly from said distal end portion of said inner wall means;

means for establishing fluid communication between said fluid delivery passage and a source of gas under pressure to be delivered to a patient; and inner intermediate wall member and an outer intermediate wall member disposed between said distal end portions of said inner and outer wall means and cooperating therewith to define a tortuous flow path for gas to be delivered to a patent;

said inner intermediate wall member being disposed between said distal end portion of said inner wall means and said outer intermediate wall member;



said outer intermediate wall member being disposed between said inner intermediate wall member and said distal end portion of said outer wall means;

each of said inner and outer intermediate wall members including a distal end portion and a proximal end portion;

a generally annular proximal wall means connecting said proximal end portion of said outer intermediate wall member to said inner wall means;

a generally annular distal wall means connecting said distal end portion of said inner intermediate wall member to said outer wall means;

said proximal end portion of said inner intermediate wall member being spaced from said generally annular proximal wall means;

said distal end portion of said outer intermediate wall member being spaced from said generally annular distal wall means;

means defining a drain port in said distal wall means for draining condensate collected in the annular space between the distal end portions of said outer wall means and said inner intermediate wall member;

said central fluid exhaust passage and said generally annular fluid delivery passage including distal end portions adjacent said distal end portions of said inner and outer wall means; and

means for connecting said distal end portions of said central fluid exhaust passage and said generally annular fluid delivery passage in fluid communication with a breathing passage of a patient.

4,249,528

MANUAL RESPIRATOR APPARATUS FOR USE WITH AUTOMATIC RESPIRATORS

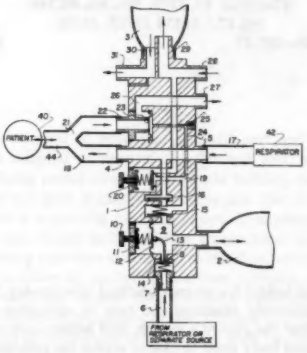
Heinz Mathes, Lübeck, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 24, 1979, Ser. No. 6,195

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1978, 2806750

Int. Cl.³ A61M *16/00*

U.S. Cl. 128—205.13 **3 Claims**



1. A manual respirator apparatus for connection to an inhalation line which is connectable between an automatic respirator and a patient and is also connected to means for supplying a breathing gas under pressure, comprising, a blocked housing having a breathing gas supply inlet connectable to the means for supplying a breathing gas under pressure, an inhalation line inlet in said housing connectable to the inhalation line, an inhalation line outlet in the housing connected to said inhalation line inlet and connectable to the patient, an exhalation line inlet connectable from the patient and connected to the housing for receiving the exhalation gas from the patient, said housing having a pressure chamber therein, an elastic breathing gas bag connected to said pressure chamber and being expandible and compressible during exhalation and inhalation to vary the pressure in said pressure chamber, a connection passage in said housing between said gas supply inlet and said pressure chamber, adjustable valve means in said pressure chamber and in said connection passage responsive to pressure in said pressure chamber and said breathing gas bag to permit flow of breathing gas through said connection passage to said breathing gas bag, a delivery passage between said pressure chamber and said inhalation line inlet, outlet valve means in said delivery passage openable at a predetermined pressure to pass breathing gas from said pressure chamber to said inhalation line inlet when said breathing gas bag is compressed, an exhalation line output in the housing connected to said exhalation line inlet for the venting of exhalation gas from the housing, a control chamber in said housing adjacent and connected to said exhalation line inlet, a diaphragm in said control chamber positioned to close said exhalation line inlet during inhalation and to open said exhalation line inlet during exhalation, and a pressure line connection between said control chamber with said diaphragm and said delivery passage for regulating the movement of said diaphragm in accordance with the pressure in said pressure chamber so that said exhalation line inlet is closed when said breathing gas bag is compressed, said outlet valve means comprising first and second outlet valve members

arranged in series in said delivery passage and biasing means connected to said first and second valve outlet members for biasing said respective first and second outlet valve members toward closed positions thereof when said gas bag is not compressed to maintain the pressure in said pressure chambers and to close said inhalation line inlet with respect to said pressure line, said pressure line connection connected to said delivery passage between said first and second outlet valve members.

4,249,529

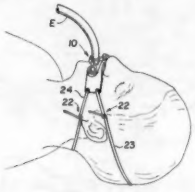
SNAP-ACTION HOLDER FOR ENDOTRACHEAL TUBE WITH ONE-WAY QUICK TIGHTENING HEAD BANDS

Jack Nestor, 110 1st Ter., San Marine Is.; Lawrence M. Ciment, 3420 Chase Ave., both of Miami Beach, Fla. 33139, and Abraham Rotbart, 5262 La Gorce Dr., Miami Beach, Fla. 33140

Filed Oct. 17, 1979, Ser. No. 85,746

Int. Cl.[3] A61M *25/02, 16/00*

U.S. Cl. 128—207.17 **10 Claims**



1. A facial holder for an endotracheal tube having the capability of releasably retaining the tube in operative position extending into the patient's mouth, said holder comprising an oblong-shaped body sized to extend across the patient's mouth between the nose and chin and overlie portions of the cheeks adjacent each side of the mouth, a pair of head encircling straps connected to opposite sides of said body adapted for one strap to extend above and the other strap to extend below the patient's ears, said straps being non-stretchable and having one-way adjustable means for tightening the fit around the patient's head to secure said body in position on the patient's lips and cheeks and requiring severing of the straps for removal of the holder from the patient's head, said body being molded of an elastomeric plastic material formed with a central cutout located below a bridge portion adapted to overlie the patient's upper lip, a pair of resilient arms integral with said body and extending into said cutout in symmetrical spaced relation having ends spaced apart a predetermined distance when the arms are in normal position, a ring clamp for releasably gripping said tube as said retaining capability comprising a pair of arcuate jaws connected by an integral hinge for pivoting between open and closed tube clamping positions, an integral hinge connecting each of said arm ends to a midportion of one of said jaws the diameter of said ring clamp being at least equal to or greater than said predetermined distance whereby said ring clamp is supported for snap-action between said open and closed positions by application of a force to said jaws in a direction normal to a straight line between said arm end integral hinges, said force serving to flex said arms to increase said predetermined distance for passage of said first mentioned hinge therebetween in performing said snap-action.

4,249,530

HYPODERMIC SYRINGE ASSEMBLY

Marcus J. Millet, New York, N.Y., assignor to Johnson & Johnson, New Brunswick, N.J.

Continuation of Ser. No. 836,109, Sep. 23, 1972, abandoned. This application May 9, 1979, Ser. No. 37,584

Int. Cl.[3] A61M *5/00*

U.S. Cl. 128—218 N **2 Claims**

1. A hypodermic syringe assembly comprising:

a syringe barrel having an axial bore therethrough;

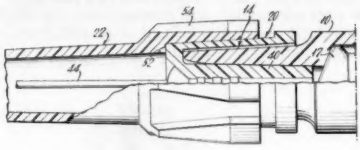
a tip integral with said barrel and having a passageway axially therethrough providing fluid communication with the axial bore of said barrel and the interior surface of said passageway having a converging taper from said tip toward said barrel; and,

said tip having an external surface having a diverging taper from said tip to said barrel, said exterior surface adapted to conform to the female tapering surface of a conventional needle hub;

a needle/hub assembly including:

a hub with an exterior surface having a converging taper conforming to the converging taper of the interior surface of said passageway in said syringe tip, said hub removably positioned in said passageway and occupying substantially the entire volume of said passageway, and said hub being held in said passageway only by frictional engagement of the tapering internal surface of said passageway with the conformingly tapering confronting exterior surface of said hub;

said hub having an axial bore therethrough providing fluid communication with said syringe barrel in which axial bore a needle may be secured;



said needle hub assembly further including a radially extending portion extending from the distal end thereof; and,

a generally annular skirt extending proximally from the radial periphery of said radially extending portion and disposed about said hub and having an interior surface confronting the exterior surface of said hub and tapering in conformity with the diverging taper on the exterior surface of said tip;

said skirt and said hub defining a space into which said tip depends when said hub is inserted into said tip passageway;

the confronting interior surface of said skirt and exterior surface of said tip being spaced apart to provide a clearance fit therebetween when said hub is frictionally positioned within said syringe tip passageway;

whereby the syringe assembly may be used with said hub positioned within said passageway to provide a substantially air-free syringe or said hub and needle may be removed from said tip to permit a conventional needle hub to be placed thereon.

4,249,531

BIOERODIBLE SYSTEM FOR DELIVERING DRUG MANUFACTURED FROM POLY(CARBOXYLIC ACID)

Jorge Heller, Palo Alto, Calif., and Richard W. Baker, Bend, Oreg., assignors to Alza Corporation, Palo Alto, Calif.

Continuation of Ser. No. 750,701, Dec. 15, 1976, Pat. No. 4,180,064, which is a division of Ser. No. 591,443, Jun. 30, 1975, Pat. No. 4,014,987, which is a continuation-in-part of Ser. No. 467,246, Jun. 4, 1974, abandoned, which is a continuation-in-part of Ser. No. 318,831, Dec. 27, 1972, abandoned. This application Jul. 5, 1979, Ser. No. 54,788

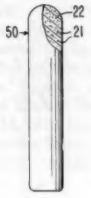
The portion of the term of this patent subsequent to May 21, 1991, has been disclaimed.

Int. Cl.[3] A61M *7/00*

U.S. Cl. 128—260 **15 Claims**

1. A surgical implant for the controlled and continuous administration of an active drug to an implant receiving animal having an essentially constant pH throughout the period of administration, the implant consisting essentially of a body sized, shaped and adapted for placement and retention in the animal, said body formed of a bioerodible drug release rate

controlling material containing the active drug, the material comprising a hydrophobic poly(carboxylic acid) having one ionizable carboxylic hydrogen atom for each 8 to 22 carbon atoms, which material bioerodes at a controlled and continu-



ous rate over a prolonged period of time in response to the essentially constant pH in the range of from pH 6 to pH 9, by a process of carboxylic hydrogen ionization, thereby releasing the active drug at a controlled and continuous rate to the animal over a prolonged period of time.

4,249,532

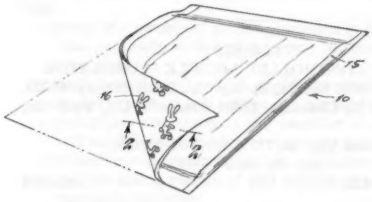
DECORATED DISPOSABLE DIAPER

Herbert Polansky, c/o George Specter 3615 Woolworth Bldg., NY, N.Y. 10007, and George Spector, New York, N.Y., assignors to Herbert Polansky, Ocean Side, N.Y.

Continuation of Ser. No. 802,733, Jun. 2, 1977, abandoned. This application Feb. 21, 1979, Ser. No. 13,321

Int. Cl.[3] **A61F** *13/16*

U.S. Cl. 128—287 **1 Claim**



1. A decorated disposable diaper and a means for decoration thereof, said diaper comprising in combination a wadding inside an envelope comprised of a transparent polyethylene sheet having inner and outer surfaces on one side adhered to an absorbent paper sheet on an opposite side thereof, and a multi-colored design reverse printed on said inner surface of said polyethylene sheet, said printed design having a seal coat underlying said design on said inner surface, said wadding having a water and oil proofed surface adjacent said inner surface; and wherein said design comprises a first design coat of black color and a second design coat of lighter color said design further including an overlying sealing coat.

4,249,533

LASER KNIFE

Osamu Komiya, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

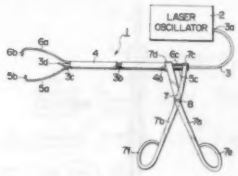
Filed May 4, 1978, Ser. No. 902,864

Claims priority, application Japan, May 16, 1977, 52/62823[U]; Jun. 21, 1977, 52/73713

Int. Cl.[3] **A61B** *17/36*

U.S. Cl. 128—303.1 **22 Claims**

1. A laser knife comprising a tubular member adapted to be inserted into the forceps channel of an endoscope, first means for generating laser radiation sufficient to cauterize tissue, a laser radiation transmission member having a first end and a second end, said laser radiation transmission member being disposed within said tubular member and extending along the length thereof for conveying laser radiation therethrough so that laser radiation derived from said first means is conveyed from said first end of said laser radiation transmission member to be emitted from said second end of said laser radiation transmission member, holding means located at said second end of said laser radiation transmission member for holding an affected part to be cauterized by said emitted laser radiation, said holding means including a pair of opposed holding members which are movable relative to one another; means for moving at least one of said holding members relative to the other between a first position and a second position, said first



position adapted to hold said affected part and said second position adapted to release said affected part, and acceptor means being positioned on one of said holding members such that said acceptor means is moved by said one of said holding members to a position disposed in optical alignment with said second end of said laser radiation transmission member when said holding members are moved to said first position from said second position for accepting said laser radiation emitted from said second end of said laser radiation transmission member upon completion of cautery of said affected part to prevent the likelihood of irradiating normal tissue with the laser radiation.

4,249,534

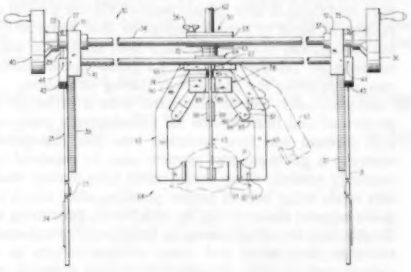
APPARATUS FOR BREAKING SCAR TISSUE WITHIN A HUMAN BODY

Louis M. Muldrow, Jr., 750 Shaker Dr., Lexington, Ky. 40504

Filed Apr. 16, 1979, Ser. No. 30,104

Int. Cl.[3] **A61B** *17/00*

U.S. Cl. 128—319 **35 Claims**



1. An apparatus for breaking scar tissue within a human body including:

force applying means to apply a continuous and increasing radially symmetrical force of substantially the same magnitude at each of a plurality of portions around an area having the scar tissue until the scar tissue breaks;

said force applying means including:

engaging means to engage the area having the scar tissue at each of a plurality of portions around the area, said engaging means including separate engaging means to engage each of the plurality of portions around the area;

and moving means to simultaneously move all of said separate engaging means radially towards a central axis to continuously increase the force at each of the plural-

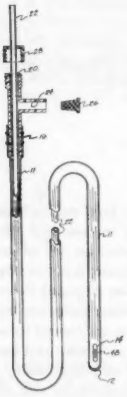
ity of portions engaged by each of said separate engaging means until the scar tissue breaks.

4,249,535

GASTRIC FEEDING DEVICE

Thomas S. Hargest, III, 1078 Winslow Dr., Charleston, S.C. 29412

Filed Feb. 2, 1979, Ser. No. 8,554
Int. Cl.[3] A61M *25/00*; A61J *15/00*
U.S. Cl. 128—348 **9 Claims**



1. A gastric feeding device for introduction into the stomach of a patient from a nasal opening of the patient comprising:

(a) an elongate flexible tube defining a longitudinal passageway therealong, said tube being of a size to permit intubation of same through a nasal opening and the esophagus into the stomach and being adapted to remain intubated for repetitive use, said tube being manufactured of a predetermined material and having a predetermined wall thickness such that said tube collapses along substantially the entire length of same in the absence of internal support, said flexible tube having means adjacent a distal end portion of same to permit passage of feed material from the passageway into the stomach after intubation and to maintain the relative position of a guide-support element receivable along the passageway during intubation;

(b) non-collapsible means associated with a proximal end portion of said flexible tube for introducing a guide-support element and feed materials into said passageway, whereby a guide-support element may be received substantially entirely along said flexible tube during intubation while being held in proper position, after which said guide-support element may be withdrawn, permitting said flexible tube to collapse along its length while intubated to minimize discomfort and other adverse effects to the patient, and whereby introduction of feed materials into said passageway of said flexible tube causes said flexible tube to reopen for passage of said materials, after which said tube again collapses; and

(c) a flexible support tube removably received in and extending throughout the length of the passageway of said collapsible tube.

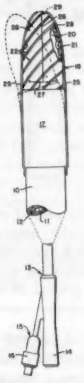
4,249,536

UROLOGICAL CATHETER

Roger E. Vega, R.D. #7, Twin Oak, Kittanning, Pa. 16201

Filed May 14, 1979, Ser. No. 38,745
Int. Cl.[3] A61M *25/00*
U.S. Cl. 128—349 B **30 Claims**

1. A flexible retention catheter comprising an elongated tubular body portion defining a drainage lumen, an inflatable balloon forming a sheath around said body portion adjacent one end thereof, an inflation lumen disposed in association with said tubular body portion to extend into communication with said balloon for conducting an inflating medium, and a soft, pliable cone-shaped tip at the end of said body portion adjacent



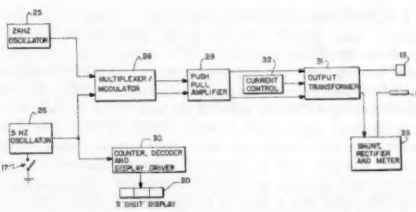
said balloon, said tip having a side wall defining a drainage eyelet extending to a drainage lumen terminating at a closed end wall within the tip, said tip having a reduced urethral contact surface defined by recesses for minimizing sliding friction during travel of the tip along the lining of the human urethra.

4,249,537

CURRENT CONTROLLED MUSCLE STIMULATOR

Ronald L. Lee, 1001 Burning Springs Cir., Louisville, Ky. 40223, and Charles G. Chaconas, 13801 Marianna Dr., Rockville, Md. 20853

Filed May 18, 1979, Ser. No. 40,458
Int. Cl.[3] A61N *1/36*
U.S. Cl. 128—422 **8 Claims**



1. An improved apparatus for producing and applying controlled muscle-stimulating electrical signals to the body, the apparatus being of the type having a pair of electrically conductive electrode means for contacting the body and conducting electricity thereto, a source of electrical energy, pulse circuit means connected to the source of energy for producing electrical pulses, and conductor means for coupling the pulses to the electrode means, the improvement wherein

said pulse circuit means includes an output transformer having a center-tapped primary winding and a secondary winding, said secondary winding being connected through said conductor means to said electrode means;

said apparatus further including current control means in said pulse circuit means for limiting the average level of current supplied to said conductor means to a predetermined level substantially independently of voltage;

and wherein said current control means includes a constant

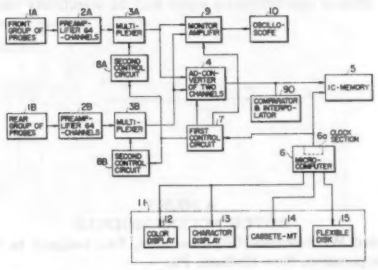
current circuit connected between said center tap and a point of reference potential, and means for adjusting the current control level of said constant current circuit.

4,249,538

ELECTRONIC CLINIC APPARATUS

Toshimitsu Musha, 13-17, Minami-Tsukushino 2-chome, Machida-shi, Tokyo; Kenichi Harumi, 36-5, Takadanobaba 3-chome, Shinjuku-ku, Tokyo; Yasuaki Teramachi, Kokubunji, and Toshiyuki Kanou, Koganei, all of Japan, assignors to Toshimitsu Musha and Kenichi Harumi, both of, Japan

Filed Dec. 12, 1978, Ser. No. 968,854
Claims priority, application Japan, Oct. 24, 1978, 53-130001
Int. Cl.[3] A61B *5/04*
U.S. Cl. 128—630 **6 Claims**



1. An electronic clinic apparatus, comprising in combination:

a group of a number of probes positioned in proximity to at least one body surface of a person subjected to a clinic operation;

a multichannel amplifier for amplifying electrical potential sensed at each of said probes and having an output;

a multiplexer connected to said amplifier at said output of said amplifier, and having analog outputs;

converter means connected to said multiplexer for converting said analog outputs of said multiplexer to corresponding digital outputs;

computer means for processing said corresponding digital outputs of said converter means to produce outputs of said computer means;

display means for displaying said outputs produced by said computer means; and

control means provided between said multiplexer and said computer means for successively reading out the sensed potentials at the probes within a variable operating period and for providing a pause period thereafter, said variable operating period being added with said pause period to define a predetermined functional cycle period, said control means intentionally removing improper probe signals including excessively large noise signals and replenishing properly calculated and established imaginary signals in place thereof, said removal and replenishing functions being performed during said pause period.

4,249,539

ULTRASOUND NEEDLE TIP LOCALIZATION SYSTEM

David H. R. Vilkomerson, Princeton; Reuben S. Mezrich, Rocky Hill, and Carl S. Rubin, Cherry Hill, all of N.J., assignors to Technicare Corporation, Solon, Ohio

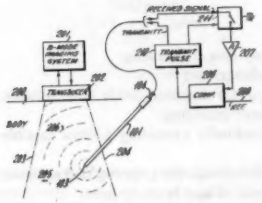
Filed Feb. 9, 1979, Ser. No. 10,564
Int. Cl.[3] A61B *10/00*
U.S. Cl. 128—660 **10 Claims**

1. Apparatus for performing surgical procedures upon select, internal body tissues, comprising:

(a) a pulse-echo ultrasound imaging system for imaging the area of the body including said tissues, said imaging system including first transducer means adapted to be acoustically coupled to the exterior of the body;

(b) hollow needle means for insertion into the body in said area at an angle and in a direction which is independent of the angle and position of said first transducer means;

(c) second omnidirectional, substantially point source transducer means, removably located at the tip of said needle means;



(d) circuit means, electrically coupled to said second transducer means, for sensing receipt of an ultrasound pulse directly from said first transducer means; and

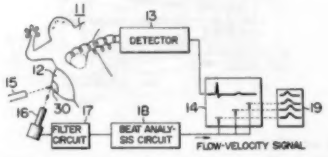
(e) means, responsive to said first transducer means and to said circuit means, for producing a composite image of said area which incorporates the position of said second transducer means into an image assembled by said imaging system.

4,249,540

OPTICAL SOMATO-MEASURING APPARATUS

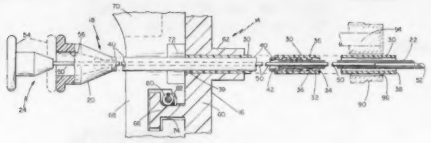
Tomiyasu Koyama; Masashi Horimoto, and Midori Horimoto, all of Sapporo, Japan, assignors to President of Hokkaido University, Hokkaido, Japan

Filed Apr. 17, 1979, Ser. No. 30,887
Claims priority, application Japan, Apr. 24, 1978, 53/48490
Int. Cl.[3] A61B *5/02*
U.S. Cl. 128—666 **3 Claims**



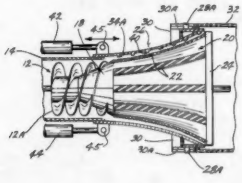
1. Optical somato-measuring apparatus comprising, means for providing a transparent sheet positionable on the surface of a living object to be diagnosed, the transparent sheet having a refractive index approximating that of the object to be diagnosed, means for supplying through the transparent sheet at least two laser beams intersecting at a measuring point within the living object being diagnosed, and means for observing the scattered light from a diagnostic point appearing at a point on the transparent sheet that is different from the points of incidence of the laser beams.

4,249,541
BIOPSY DEVICE
David S. Pratt, 80 Susquehanna Ave., Cooperstown, N.Y. 13326, assignor to David S. Pratt, Cooperstown, N.Y.
Filed Apr. 26, 1979, Ser. No. 33,742
Int. Cl.[3] A61B *10/00*
U.S. Cl. 128—753 **16 Claims**



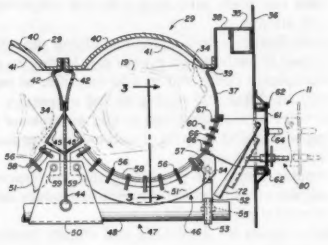
1. A biopsy unit comprising:
an outer catheter, and
an inner aspirator disposed inside said catheter,
said catheter including
a longitudinally extending hollow flexible housing tube, and
means for selectively gripping said aspirator disposed near one end of said housing tube,
said aspirator including
a longitudinally extending hollow flexible aspirating tube disposed inside said housing tube and longitudinally slidable within said housing tube when not gripped by said gripping means,
a connector fastened to one end of said aspirating tube and adapted to be fitted to a suction source, and
a hollow needle fastened to the other end of said aspirating tube, said needle being less flexible than said aspirating tube, the lumen of said needle communicating with said connector through said aspirating tube,
whereby cell material is collected in the lumen of said needle when said aspirating tube is moved within said housing tube so that said needle is inserted into the cell material.

4,249,542
COMBINE
Murry W. Schuler, Box 66, Rte. #2, Griswold, Iowa 51535
Filed Dec. 20, 1979, Ser. No. 105,943
Int. Cl.[3] A01F *7/06, 12/18*
U.S. Cl. 130—27 T **8 Claims**



1. In a combine,
a longitudinally extending auger having rearward and forward ends and being mounted in a first casing spaced outwardly therefrom,
said auger comprising a second casing having spiral flighting thereon for conveying cut crop material rearwardly between the exterior surface of said second casing and the interior surface of said second casing,
means for rotating said auger,
a longitudinally extending threshing cylinder mounted on the rearward end of said auger for rotation therewith and having rearward and forward ends
said cylinder having an arcuately flared configuration with its rearward end having a larger diameter than its forward end,
a longitudinally extending concave longitudinally adjustably movably embracing said cylinder and having rearward and forward ends,
said concave being spaced from said cylinder to define a threshing space therebetween,
said concave having an arcuately flared configuration with its rearward end having a larger diameter than its forward end,
the forward end of said concave being in communication with the rearward end of said first casing whereby the cut crop material will be delivered by said auger to the forward portion of said threshing space,
and means for longitudinally adjustably moving said concave relative to said cylinder whereby the cross-sectional area of said threshing space may be selectively varied.

4,249,543
ROTOR ACCESS MODULE
Edward W. Rowland-Hill, Lancaster, Pa., assignor to Sperry Corporation, New Holland, Pa.
Filed Nov. 2, 1979, Ser. No. 90,783
Int. Cl.[3] A01F *12/00*
U.S. Cl. 130—27 T **5 Claims**



1. In a harvesting and threshing machine for harvesting crop material from a field having:
(a) a mobile frame having a front end and a rear end;
(b) rotary threshing and separating means mounted to the frame in longitudinal orientation therewith having a first portion nearer the front end for threshing and a second portion nearer the rear end for separating grain from the crop material;
(c) drive means mounted to the frame to propel the machine across the field and to drive the threshing and separating means;
(d) an elongate generally cylindrical casing means fastened to the frame surrounding the threshing and separating means;
(e) grain receiving means fastened to the frame and underlying the casing means; and
(f) a rotor access module having a first portion attached to said frame, and having a second portion forming a concave portion of said casing means, said second portion including a plurality of threshing bars, said first and second portions interconnected, in spaced apart relationship, by side plates, said module further having at least one deflector plate connected to said side plates.

4,249,544

METHOD AND APPARATUS FOR GENERATING SIGNALS FOR ADJUSTMENT OF CIGARETTE ROD MAKING MACHINES OR THE LIKE

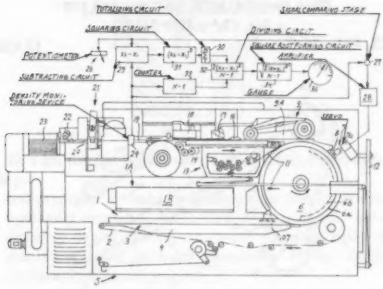
Joachim Reuland, Neu-Börnsen; Herbert Hinze, and Lutz Reitmeier, both of Hamburgh, all of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed Sep. 28, 1979, Ser. No. 79,829

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1978, 2842969

Int. Cl.³ A24B 5/38

U.S. Cl. 131—21 B 10 Claims



1. A method of forming regulating signals in cigarette making or like machines wherein a continuous rod of fibrous material is conveyed lengthwise, comprising the steps of monitoring a characteristic of the moving rod and generating first signals which denote said characteristic of predetermined lengths of the rod; comparing said first signals with a reference signal denoting the desired characteristic of said predetermined lengths and generating third signals denoting the difference between said first signals and said reference signal; squaring successive groups of N third signals and totalizing successive groups of N squared signals to form fourth signals; generating fifth signals corresponding to the sums of N−1 first signals; dividing successive fourth signals with corresponding fifth signals to form sixth signals; and generating said regulating signals, including forming square roots of successive sixth signals.

4,249,545

METHOD AND APPARATUS FOR PERFORATING THE ENVELOPES OF FILTER CIGARETTES OR THE LIKE

Heinz Gretz, Hamburg; Willy Rudszinat, Dassendorf, and Heinz-Christen Lorenzen, Hamburg, all of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

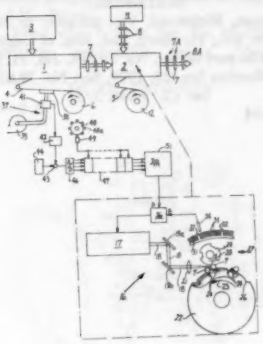
Filed Oct. 30, 1978, Ser. No. 955,691

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1977, 2750038

Int. Cl.³ A24B 7/14

U.S. Cl. 131—21 R 54 Claims

26. Apparatus for increasing the permeability of tubular envelopes of cigarettes or analogous rod-shaped smokers' products wherein the envelope constitutes one component of the product and surrounds at least one rod-like body which constitutes another component of the product, comprising adjustable perforating means including means for making holes in at least one selected portion of the envelope of each of a series of rod-shaped products; means for moving said series of products past said perforating means; means for monitoring at least one variable characteristic of at least one component of each product of said series, including means for generating first signals denoting the monitored characteristics of successive monitored components; means for comparing said first signals with a reference signal denoting the desired characteristic of each monitored component; and means for adjusting said perforating means to change the combined cross-sectional area of



holes in the envelopes of products embodying those components whose monitoring resulted in the generation of first signals deviating from said reference signal.

4,249,546

APPARATUS FOR FILLING EMPTY CIGARETTE TUBES

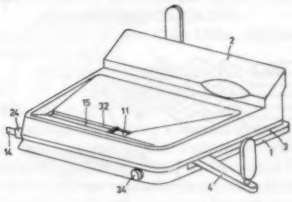
Richard Heil; Klaus Gätschmann, and Anton Wieshofer, all of Trossingen, Fed. Rep. of Germany, assignors to Efka-Werke Fritz Kiehn GmbH, Trossingen, Fed. Rep. of Germany

Filed Jul. 27, 1979, Ser. No. 62,232

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1978, 2833681

Int. Cl.³ A24C 5/02, 5/42

U.S. Cl. 131—70 5 Claims

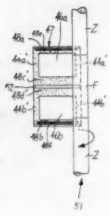


1. In an apparatus for filling cigarette blanks with tobacco, which includes a housing, a tobacco magazine having an opening through which tobacco may be placed therein, a moveable pressure plate moved by an operating lever and capable of exerting compressive forces on tobacco contained in the tobacco magazine and an expeller rack, moved by gears actuated by the operating rod, an improvement comprising movable limiting means for selectively limiting amount of tobacco placed in said tobacco magazine, said movable limiting means including a slide which is positioned and arranged partially to cover said opening in said tobacco magazine.

4,249,547
METHOD AND APPARATUS FOR APPLYING ADHESIVE TO RUNNING WEBS OF WRAPPING MATERIAL

Alfred Hinzmann, Richmond, Va., assignor to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 56,798, Jul. 11, 1979. This application Sep. 28, 1979, Ser. No. 79,828
Int. Cl.[3] A24C 5/52
U.S. Cl. 131—94 23 Claims

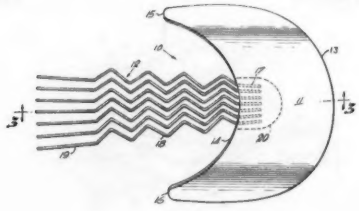


1. A method of treating a web of wrapping material in a machine for the processing of rod-shaped smokers' products, comprising the steps of transporting the web lengthwise along a predetermined path; coating one side of the moving web, including applying to said one side a recurrent pattern of adhesive which comprises first fields including discrete longitudinal strips adjacent to but slightly spaced apart from at least one marginal portion of the web and having a first thickness and second fields including portions disposed between said strips and having a second thickness less than said first thickness; and repeatedly severing the leader of the moving web across said portions of successive second fields so that said web yields a series of discrete uniting bands each having two first parallel edges one of which is adjacent to the respective longitudinal strip and two second parallel edges adjacent to the end portions of the respective longitudinal strip.

4,249,548
COMBINATION SUN VISOR AND HAIR PICK

Rafael Jerman, 6850 W. 14th Ct. Apt. 25-C, Hialeah, Fla. 33014

Filed May 16, 1979, Ser. No. 39,511
Int. Cl.[3] A45D 1/00
U.S. Cl. 132—9 3 Claims

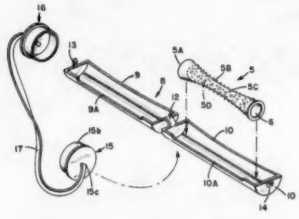


1. A combination sun visor and hair pick comprising, in combination, a substantially rigid visor body member, said visor body member having a front edge portion of convexly arcuate shape and a concavely-arcuate rear edge portion, said visor body member further being of arcuate shape from side-to-side, a plurality of elongated spring wire pick members extending outwardly of a central zone along said concavely-arcuate rear edge portion of said body member and in mutually spaced relation therealong, said pick members having serpentine configurated central portion along their lengths for frictional retainment in an "Afro hair-do", said pick members having straight outer end portions suited to use as a hair pick upon using said visor body member as a manipulating handle, the ends of said concavely-arcuate rear edge portion of said visor body member merging with the ends of said convexly-arcuate front edge portion of said visor body member at opposed, reversely-rounded merging edge portions, said pick members being downwardly curved in the direction of said reversely-rounded merging edge portions.

4,249,549
ROOT PERM ROD

John Cusenza, Tarzana, Calif., assignor to Sebastian International Inc., Chatsworth, Calif.

Filed Oct. 26, 1978, Ser. No. 955,177
Int. Cl.[3] A45D 2/36
U.S. Cl. 132—36 C 13 Claims



1. An apparatus for protecting from fluid treatment the end section of a length of hair comprising:

casing means for enclosing and isolating from fluid treatment said end section to be protected;

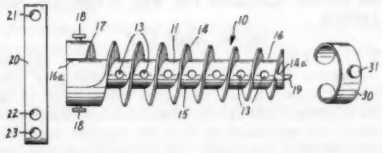
slot means located in said casing means for allowing a length of hair to pass in a layer from the inside of said casing means to the outside of said casing means;

sealing means for isolating from fluid treatment said end section to be protected from a section of the same length of hair located outside said casing means whereby said casing, slot, and sealing means cooperate to protect the end section of a length of hair located within the casing means from exposure to fluid treatment applied to hair external to the casing means.

4,249,550
WAVE ROD

Harry E. Cassidy, 495 Kenny Rd., St. Paul, Minn. 55101

Filed Sep. 24, 1979, Ser. No. 78,084
Int. Cl.[3] A45D 2/26
U.S. Cl. 132—41 R 6 Claims



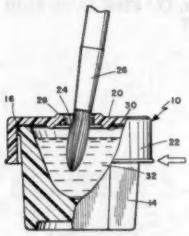
1. A wave rod for use in imparting curl to hair, said rod having a proximal end and a distal end and comprising a tubular core having an integrally formed helical fin on its peripheral surface, a substantial portion of said peripheral surface being exposed between successive turns of said fin, thereby providing a flat-bottomed helical channel for accommodating a strand of hair.

4,249,551

FINGERNAIL KIT

Stuart S. Nordstrom, 1720 Hunsaker St., Oceanside, Calif. 92054

Filed Sep. 14, 1979, Ser. No. 75,826
Int. Cl.[3] A45D 29/00
U.S. Cl. 132—73 6 Claims



1. In a kit for the construction of artificial fingernails comprising:

a first container defined by a thick high density bottom and upwardly extending walls forming a generally upwardly opening cavity having an upper opening equal to the maximum cross-sectional dimension of the cavity for containing a liquid reagent;

a cover detachably fitted on said first container over the opening for substantially covering said opening; and

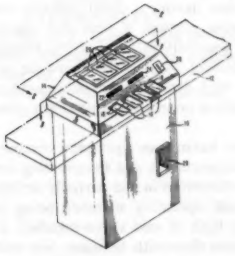
said cover being constructed to define an aperture of reduced size in said cover for receiving a brush in close fitting association therewith.

4,249,552

AUTOMATIC MONEY HANDLING DEVICE

George D. Margolin, Newport Beach, and Victor V. Vurpillat, Laguna Niguel, both of Calif., assignors to Auto Register, Inc., Costa Mesa, Calif.

Filed Nov. 6, 1978, Ser. No. 957,913
Int. Cl.[3] G07D 1/06
U.S. Cl. 133—1 R 22 Claims



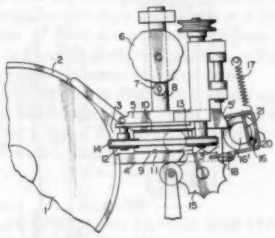
1. In a cash handling apparatus comprising in combination: a housing means having a top, bottom, front, back, and side surfaces; said front surface having at least one input-output channel formed therein for receiving and dispensing bills; said top surface having at least one viewing window formed therein; at least one transparent money belt means having two belt members contained within said housing means; at least two driven unstoring reel means and at least one driven storing reel means for driving each of the transparent money belt means; the money belt means disposed within the housing such that a bill is transported by the money belt means from the input-output channel to a position opposite the viewing window prior to reaching the storing reel.

4,249,553

COIN GUIDING DEVICE FOR USE IN A COIN PROCESSING MACHINE

Hideshi Sentoku, Tokyo, Japan, assignor to Laurel Bank Machine Co., Ltd., Japan

Filed Mar. 7, 1979, Ser. No. 18,270
Claims priority, application Japan, Mar. 24, 1978, 53-37748197
Int. Cl.[3] G07D 9/06
U.S. Cl. 133—1 A 3 Claims



1. A coin guiding device for use in a coin processing machine of the type in which coins are accumulated into an accumulating cylinder from a coin passage, which device comprises;

a coin passage defined by a fixed guide and a movable guide, said movable guide being moved to vary the width of the coin passage in accordance with the diameter of the coins to be packaged,

an accumulating cylinder positioned below the discharge end of the coin passage, the center of the accumulating cylinder being in alignment with the travelling center line of a coin of a certain kind, and

a guiding chute mounted between the discharge end of the coin passage and the accumulating cylinder, said guiding chute being operatively associated with the movable guide to guide the coins toward the center of the accumulating cylinder, with the movable guide being provided at the one end thereof with a cam surface, and with the guide chute being pivotably mounted and being varied in orientation by the engaging point of the cam surface and the one side wall of the guide chute.

4,249,554

METHOD OF TRANSPORTING VISCOUS HYDROCARBONS

Gifford G. McClaflin, Ponca City, Okla., assignor to Conoco, Inc., Ponca City, Okla.

Filed Jan. 26, 1979, Ser. No. 6,624
Int. Cl.[3] F17D 1/17
U.S. Cl. 137—13 14 Claims

1. In the method of pumping a viscous hydrocarbon through a pipe the improvement which comprises forming an oil-in-water emulsion by adding to said hydrocarbon from about 20 to about 80 volume percent of an aqueous solution containing an effective amount, based on said hydrocarbon, of a combination of about 50 to about 10,000 parts per million of an ethoxylated alkyl phenol and about 50 to about 10,000 parts per million of an ethoxylated alcohol sulfate, said ethoxylated alkyl phenol being a monoalkyl phenol wherein the alkyl group contains from about 8 to about 12 carbon atoms, and which contains from about 40 to about 70 ethoxy groups, and said ethoxylated alcohol sulfate is represented by the formula

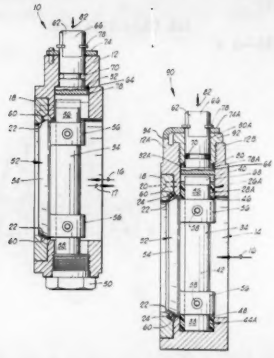
$$[CH_3(CH_2)_xCH_2(OCH_2CH_2)_nOSO_3]M$$

wherein x is an integer in the range of about 10 to about 16, n is a number in the range of about 1 to about 50, and M is ammonium or sodium.

4,249,555
FIRE SAFE DISC VALVE

Domer Scaramucci, 3245 S. Hattie, Oklahoma City, Okla. 73129

Filed Dec. 30, 1977, Ser. No. 865,853
Int. Cl.[3] F16K *1/20, 17/38*
U.S. Cl. 137—72 7 Claims



1. A fire safe disc valve, comprising:

a valve body having a flow passageway therethrough and having a first stem operating aperture and a bearing aperture coaxially positioned on opposite sides of the flow passageway, the first stem operating aperture communicating with the exterior of the valve body, the valve body having an annular flow sealing seat disposed to face the flow passageway and a stem sealing seat disposed to face the flow passageway;

a disc shaft having a first end and a second end, the first end thereof disposed in the first stem operating aperture and a second end disposed in the bearing aperture;

first packing means disposed in the first stem operating aperture for supporting and sealing about the disc shaft therein;

second packing means disposed in the bearing aperture for supporting and sealing about the disc shaft therein, the disc shaft having limited downstream displacement toward the flow sealing seat of the valve body under the pressure of fluid in the flow passageway in the event the first and second packing means are destroyed;

a disc having an annular flow sealing face and connected to the disc supporting portion of the disc shaft in the flow passageway, the disc positionable by rotation of the disc shaft in a passage sealing position and in a passage opening position;

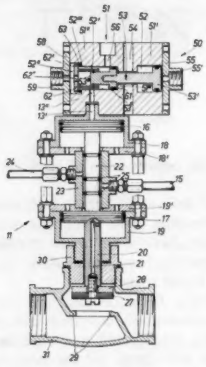
disc sealing means for sealing the flow passageway between the flow sealing face of the disc and the flow sealing seat of the valve body when the disc is in the passage sealing position, the passageway being sealable by the sealing together of the flow sealing face of the disc and the flow sealing seat of the valve body by the downstream displacement of the disc shaft and the disc under the pressure of fluid in the flow passageway in the event the first packing means, the second packing means and the disc sealing means are destroyed; and

an operating stem rotatably supported in the stem operating aperture and having an operating end, a stem engaging end, and a stem sealing face, the stem sealing face disposed to face the stem sealing seat on the valve body, the stem engaging end engageable with the first end of the disc shaft so that rotation of the operating stem effects rotation of the disc shaft selectively to the passage sealing position and the passage opening position, and the operating stem being displaceable toward the stem sealing seat under fluid pressure on the stem engaging end in the event the first packing means is destroyed.

4,249,556
ISOLATING AND BACKFLOW PREVENTING VALVE ASSEMBLY

Alfred Waletzko, Zum Berger See 137, 5820 Gevelsberg, Fed. Rep. of Germany

Filed Oct. 25, 1978, Ser. No. 954,545
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1977, 2747941; Feb. 15, 1978, 2806310
Int. Cl.[3] F16K *31/36;* E03B *7/07*
U.S. Cl. 137—107 13 Claims



1. An isolating valve assembly for use in combination with a conduit through which liquid is only supposed to flow from a high-pressure upstream portion to a low-pressure downstream portion, said assembly comprising:

a cutoff valve between said portions and having a cutoff-valve member displaceable between a closed position blocking fluid flow between said portions and an open position permitting fluid flow between said portions;

a drain valve having a drain conduit connected to said downstream portion, a vent line opening outside said portions generally at atmospheric pressure, and a drain-valve member displaceable between a closed position isolating said drain conduit from said vent line and an open position connecting said drain conduit to said vent line;

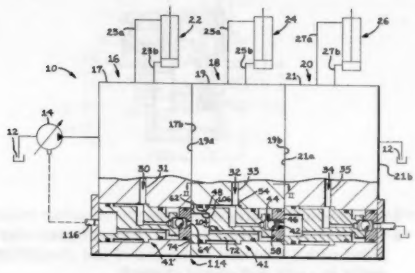
an operator having an upstream compartment, a downstream compartment, and an operating member exposed in opposite directions in and partially defining said compartments, said operating member being operatively connected to both of said valve members and being jointly displaceable therewith between one end position corresponding to said open position of said cutoff-valve member and said closed position of said drain-valve member and another end position corresponding to said closed position of said cutoff-valve member and said open position of said drain-valve member; and

conduit means connecting said upstream and downstream portions to said upstream and downstream compartments for pressurizing same and holding said operating member in said one end position when the pressure in said upstream portion exceeds that in said downstream portion by a predetermined minimum and for displacing said operating member into said other end position when the pressure differential between said portions falls below said predetermined minimum.

4,249,557
LOAD RESOLVER

Cyril W. Habiger, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US79/00968, § 371 Date Nov. 8, 1979, § 102(e) Date Nov. 8, 1979.
This PCT application filed Nov. 8, 1979, Ser. No. 102,197
Int. Cl.³ F15B *11/16;* F15C *3/06*
U.S. Cl. 137—112 **9 Claims**



1. In a load resolver **(41)** of the type which receives a pair of generally unequal pressure signals **(32, 34)** in a chamber **(42)**, said chamber **(42)** having means **(44)** for blocking the lesser of said signals **(32, 34)**, an improvement comprising:

a body **(19)** with a bore **(48)** therein;

a first member **(58)** fitted within said bore **(48)** and having a first hole **(64)** extending axially relative to said bore **(48)** and communicating with a second end **(62)** of said first member **(58)**;

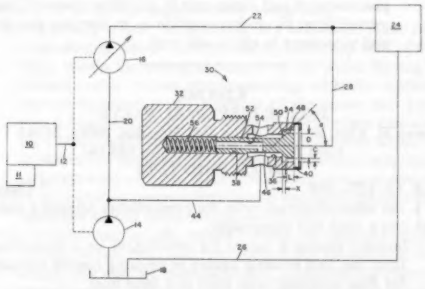
a second member **(72)** fitted within said bore **(48)**, said second member **(72)** having a second hole **(78)** extending axially relative to said bore **(48)** and communicating with said first hole **(64)**, said first and second holes **(64, 78)** defining said chamber **(42)** therebetween, and a slot **(86)** communicating a first annular groove **(88)** of said second member **(72)** with said second hole **(78)**; and,

transmitting means **(94)** for transmitting the greater of said signals **(32, 34)** from said chamber **(42)** to an end **(74)** of said second member **(72)**.

4,249,558
BYPASS VALVE

Jimmie D. Clifford; David E. Girsch, both of Waterloo, and Michael K. Magruder, Hudson, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Nov. 9, 1978, Ser. No. 959,239
Int. Cl.³ G05D *7/01*
U.S. Cl. 137—115 **6 Claims**



1. In a fluid system having a fluid pump with an inlet connected to a fluid reservoir and an outlet connected to a fluid function, a valve comprising:

(a) a valve body having interconnected first and second longitudinally extending coaxial bores provided therein, said first bore connected opposite said second bore to said pump outlet and said second bore connected opposite said first bore to said pump inlet;

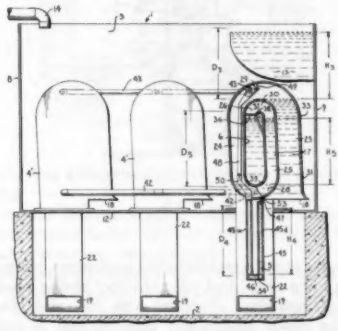
(b) longitudinally extending valve means disposed in said first and second bores and movable between open and closed positions respectively allowing and blocking fluid communication between said first and second bores, said valve means comprising a cylindrical portion, a frusto-conical portion and a stem portion, said valve means cooperating with said first and second bores for causing a predetermined pressure drop thereacross at a first predetermined flow of fluid above a predetermined dynamic viscosity or at a second predetermined flow of fluid below said predetermined dynamic viscosity; and

(c) biasing means disposed in said valve body for urging said valve means to the open position and responsive to said predetermined pressure drop to allow said valve means to move to the closed position.

4,249,559
RELIABLE TRAP FILLING DEVICE FOR SIPHON APPARATUS

John A. George, R.R. 1, Uniontown, Kans. 66779

Continuation-in-part of Ser. No. 821,404, Aug. 3, 1977, Pat. No. 4,181,142. This application May 30, 1979, Ser. No. 43,693
Int. Cl.³ F04F *10/00*
U.S. Cl. 137—124 **27 Claims**



1. In a liquid siphon apparatus adapted for discharging liquid from a tank, said siphon apparatus having at least two legs and a liquid trap communicating between said legs and allowing liquid flow from one of said legs to the other of said legs, a device for insuring the filling of said liquid trap after discharge of liquid from said tank comprising:

(a) liquid holding means independent from said tank and defining a periodically submerged liquid holding chamber elevated above at least a lower portion of said liquid trap;

(b) flow means providing flow communication between said holding chamber and liquid in said liquid trap so as to substantially fill said holding chamber with liquid as said tank fills with liquid and before said siphon discharges liquid from said tank; and

(c) restrictive communicating means positioned between said holding chamber and said liquid trap through which liquid in said holding chamber flows into said liquid trap at a rate substantially less than normal flow rate between said legs, whereby the siphon action of said siphon apparatus does not empty said holding chamber when the liquid in said tank is discharged through said legs and said liquid trap subsequently refills with holding chamber contained liquid, whereupon said siphon apparatus is reliably prepared for reuse.

14. In a liquid siphon having a flow pathway which comprises a plurality of legs and a liquid trap positioned between and flow communicating with two of the legs, the improvement comprising:

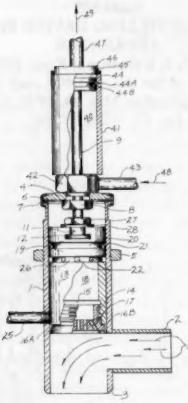
(a) one of said legs having a substantially reduced cross-sectional area as compared to one of said legs positioned upstream in said flow pathway relative to said reduced leg.

4,249,560

AUTOMATIC VALVE CLEAROFF

Glen F. Raque, 11107 Ainwick Ct., and Edward A. Robinson, 8914 Pine Lake Dr., both of Louisville, Ky. 40202

Filed Mar. 28, 1979, Ser. No. 24,579
Int. Cl.[3] F16K *11/06*
U.S. Cl. 137—240 4 Claims



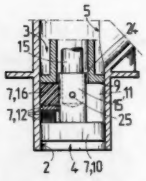
1. A valve arrangement including an elongate housing means defining a first cylindrical valve chamber having a fluid outlet means in longitudinal alignment with the valve chamber, a fluid inlet means substantially perpendicular to said outlet means; slide valve means selectively slidable within said housing means from an open position where said valve inlet means and said valve outlet means are in communication through said housing means providing for the flow of a selected first fluid through said housing means to a closd position where said slide valve means closes off said valve inlet means to block flow of said fluid through said valve housing where a first end of said slide valve means closes said valve outlet means; wherein said slide valve means includes first fluid inlet means communicating with internal passageway means and outlet means in said first end of said valve means, said outlet means communicating with said passageway means for emission of a selected second fluid from said first end of said slide valve means to clear said first fluid from said first end of said slide valve means when said slide valve means is in said closed position and wherein said valve housing means includes fluid inlet supply means for supplying said second fluid adapted to be in aligned communicative relation with said first fluid inlet means of said valve means only when said valve member is in said closed position; said fluid inlet supply means being out of communication with said first fluid inlet means of said slide valve means when said slide valve means is in said open position, and valve operator means to operate said valve means between said open and closed position.

4,249,561

PISTON TYPE CLEANING VALVE

Jarmo Marttinen, Hakolahdenkuja 4 a 2, 00200 Helsinki 12, Finland

Filed Feb. 6, 1979, Ser. No. 9,860
Claims priority, application Finland, Feb. 8, 1978, 780408
Int. Cl.[3] F16K *51/00, 25/00, 31/44*
U.S. Cl. 137—244 6 Claims



1. A self-cleaning valve comprising:

a body having a cylindrical flow channel therein and provided with a fluid inlet at one end of said channel and an outlet in a side wall of said channel;

a closing device associated with said body comprising an actuating member and a piston unit connected to said actuating member, said piston unit being displaceable in said flow channel into a closing position between said inlet and said outlet for closing said valve and into an opening position for allowing communication between said inlet and said outlet for opening the valve, said piston unit including a sealing ring of resilient material and at least two piston rings;

said actuating member comprising:

a first actuating means including a push pipe associated therewith, a second actuator means including a pull rod extending through said push pipe for moving said pull rod within said pull pipe and for locking said push rod in said pull pipe closing said valve;

said piston unit further including a first flange connected to said push pipe, a second flange connected to said pull rod, and said flanges being spaced apart from each other axially and defining a piston and having a gap therebetween; and,

said sealing ring of resilient material and said at least two piston rings being fitted within said gap, said piston rings and said resilient material together with said piston defining said piston unit, the diameter of said sealing ring being smaller than the diameter of said piston rings in an unlocked position of said second actuator means whereby said piston rings shear off impurities adhered to the wall of said flow channel during movement of said piston rings in contact with said wall during displacement of said piston unit in said flow channel when moved from its closing position to its opening position and vice-versa to clean said wall.

4,249,562

INLINE DISPERSAL VALVE

Lloyd H. King, Sr., 311 Blake Rd., Hopkins, Minn. 55343

Filed Nov. 6, 1978, Ser. No. 958,167
Int. Cl.[3] B01D *11/02*
U.S. Cl. 137—268 7 Claims

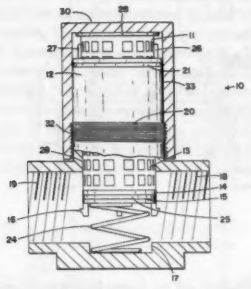
1. An inline dispersal valve for controllably releasing material into a fluid line comprising:

a housing having a means for attachment to a pressurized fluid line, said housing having an opening therein operable for fluid coupling with fluid in a fluid line;

a porous container slideably mounted in opening in said housing;

means for controllably raising or lowering said container into the pressurized fluid line to allow fluid to flow

through said container to thereby dissolve soluble solid in said container and transport said dissolved material into the fluid stream; and



resilient means for maintaining said container in contact with said means for controllably raising or lowering said container.

4,249,563

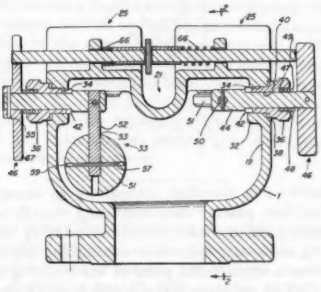
MANIFOLD FOR REPLACING RELIEF VALVES

Harry N. Shaw, Hendersonville, N.C., assignor to The Protectoseal Company, Bensonville, Ill.

Filed Oct. 17, 1979, Ser. No. 85,503

Int. Cl.³ F16K *43/00, 35/14*

U.S. Cl. 137—315 **11 Claims**



1. In a relief valve manifold having a piped flange for a base, a contiguous, enlarged and elongated sidewall mounted thereon for a body and a pressure-tight, horizontal wall sealed thereon for a top, the improvement comprising:

(a) a plurality of port means lying in a horizontal plane and depending in side-by-side relation from the top wall of the body within the enlarged portion of the same, having a bleeder valve means communicating with the outside thereof mounted in the sidewall of the same, said port means being mounted to straddle a vertical plane containing a horizontal swing-axis running therethrough adjacent to and below the plane of the port means within said body and a plurality of valve means for closing said port means;

(b) a port-closing means operationally-mounted through the sidewalls of said body on said swing-axis;

(c) at least one handle means having an aperture therethrough offset from and extending in the direction of the swing axis and an inner side face perpendicular thereto operationally-connected to the port-closing means outside of and on the swing-axis of the manifold for actuating each valve means for closing each port; and

(d) interlocking means mounted on the top wall of the body outside of said manifold operationally-engaging the aperture in one of said handle means and abutting the inner side face of the other handle means for selectively permitting the closing of one of said port means one port at a time while positively maintaining the remaining ports open for servicing the valve means in the closed port means.

4,249,564

VALVE MOUNT FOR A COMPRESSOR PRESSURE VALVE

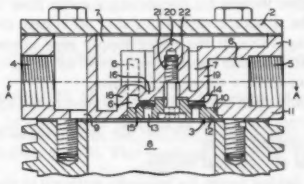
Hans-Dieter Gelse, Gehrden; Werner Heger, Sehnde, and Manfred Kramer, Barsinghausen, all of Fed. Rep. of Germany, assignors to WABCO Westinghouse GmbH, Hanover, Fed. Rep. of Germany

Filed Aug. 10, 1978, Ser. No. 932,825

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1977, 2379897

Int. Cl.³ F04B *39/06, 39/10*

U.S. Cl. 137—340 **2 Claims**



1. A mounting arrangement for a compressor pressure valve comprising:

(a) a cylinder head secured to a compressor cylinder and having formed therein an outer cooling chamber through which coolant may be circulated;

(b) a substantially cylindrical valve mount formed integrally and disposed coaxially within said cylinder head adjacent said compressor cylinder and surrounded by said outer cooling chamber;

(c) an annular valve seat disposed coaxially within a counter bore formed in the valve mount adjacent the compressor cylinder,

(d) said valve mount comprising:

(i) an inner concentric cylindrical, smaller-diameter portion formed integrally with and extending coaxially away from the valve mount and being provided with a tapped blind bore for receiving a bolt by which the valve seat is secured to the valve mount, and

(ii) an outer cylindrical portion formed integrally with and extending coaxially from the valve mount in concentrically surrounding relation to said inner cylindrical portion to form an annular space therebetween forming an inner cooling chamber open to said outer cooling chamber, and

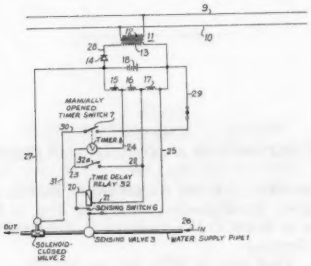
(iii) an annular pressure chamber formed in said valve mount between and in coaxial relationship to said inner and outer cooling chambers and isolated therefrom; and

(e) normally closed valve means operably disposed on said valve seat between said compressor cylinder and said pressure chamber and being operable responsively to air pressure from the compressor cylinder to an open disposition in which said pressure chamber is supplied with said air pressure.

4,249,565
TIMED WATER SHUT OFF SYSTEM

Russell E. Brust, 216 Maureen Cir., Pittsburgh, Calif. 94565

Continuation-in-part of Ser. No. 947,883, Oct. 2, 1978, abandoned. This application Mar. 21, 1980, Ser. No. 132,638
Int. Cl.[3] F16K *31/02*
U.S. Cl. 137—495 1 Claim



1. A water shut off system for preventing a flow of water to a structure after the lapse of a predetermined period of time after a flow of water to the structure commences, said water shut off system having a water supply pipe with a solenoid-closed valve therein for preventing a water flow through the pipe to the structure, said water shut off system comprising

a sensing valve in the water supply pipe upstream of the solenoid-closed valve constructed so as to open in response to flow through said pipe;

a normally open sensing switch coupled to the sensing valve and constructed so as to close in response to opening of said sensing valve;

a source of electrical energy;

a timer having means for manually setting it to time out after a set time;

a normally open timer switch coupled to said timer and maintained open by said timer in accordance with the setting of said timer and during energization of said timer, said timer switch being closed upon the timing out of said timer and opened manually;

a first plurality of electrical conductors electrically connecting the sensing switch, the source of electrical energy and the timer in a first circuit whereby a flow of water in the water supply pipe at the sensing valve opens said sensing valve and closes the sensing switch thereby energizing the timer; and

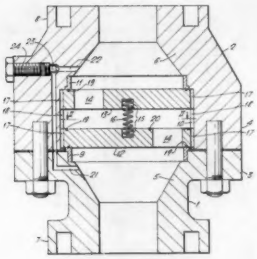
a second plurality of electrical conductors electrically connecting the source of electrical energy, the timer switch and the solenoid-closed valve in a second circuit whereby the sensing valve activates the timer and after the lapse of the period of time for which the timer is set, said timer closes the timer switch thereby energizing the solenoid-closed valve to close said solenoid-closed valve to prevent a flow of water to the structure.

4,249,566
FLUID PRESSURE-OPERATED VALVES

Moray P. Deane, Glasgow, Scotland, assignor to D S B Valves Limited, Glasgow, Scotland

Filed Feb. 5, 1979, Ser. No. 9,670
Int. Cl.[3] F16K *15/02*
U.S. Cl. 137—498 4 Claims

1. An emergency two-way shut-off valve comprising a housing and two valve members each one of which is movable apart from and towards the other valve member and spring-urged apart toward respective stops within the housing, the valve members having openings therethrough which, when the valve members are spaced apart, permit flow of fluid through the valve but, when the valve members are pressed

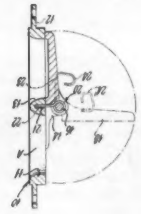


together, are blocked off by imperforate portions of the valve members.

4,249,567
CHECK-VALVE CONSTRUCTION

Paul D. Weiss, Eastlake, Ohio, assignor to Transamerica DeLaval Inc., Princeton, N.J.

Filed Oct. 2, 1979, Ser. No. 81,132
Int. Cl.[3] F16K *15/03*
U.S. Cl. 137—512 12 Claims



1. A check-valve assembly, comprising an annular body with a fluid-flow passage bore extending therethrough between upstream and downstream ends of said body, said valve body having valve-seat formations establishing plural valve-seat regions at a single radial plane of valve-seating action, a plurality of valve members corresponding to the number of valve-seat regions with each valve member having a valve-closing position at a different one of said valve-seat regions, each valve member having two spaced hinge arms pintel-connected to said body, and a separate frame-referenced pintel-supported coil spring for each valve member, each said coil spring having a body referenced arm at one end and a valve-member biasing arm at the other end, said biasing arm urging its associated valve member to valve-closing position, and said biasing arm including at its outer end an integrally formed up-stop contact portion configured and positioned for yielding abutment to provide a cushioning effect in the valve open position.

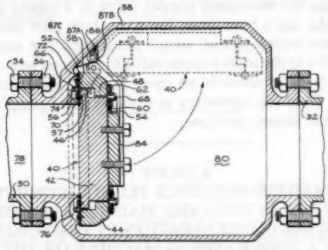
4,249,568
BACKFLOW PREVENTER VALVE

Daniel C. Duggan, 3336 Krem Ave., St. Ann, Mo. 63074

Filed Oct. 2, 1978, Ser. No. 947,778
Int. Cl.[3] F16K *15/03, 24/02*
U.S. Cl. 137—513 1 Claim

1. A backflow preventer valve comprising a housing structure having inlet and outlet ports therethrough for attaching to system conduits, a chamber formed in said housing structure, a pair of spaced valve seats associated with one of the said ports,

an air space formed in said housing structure by and between said valve seats, a movable valve assembly including means hingedly attaching it to said housing for movement in said chamber between a closed position adjacent to said valve seats and an open position angularly related to said closed position, said valve assembly having a clapper portion defined by relatively movable inner and outer members with an annular space formed therebetween to enable limited axial and radial movement therebetween, an annular flexible valve seal member bridging the annular space between the inner and outer members on one side of the clapper portion including annular first means for sealably attaching said flexible valve seal member to said inner member and second annular means spaced out-



wardly from the first annular means for sealably attaching said valve seal member to the outer clapper member, said flexible valve seal member having a first portion engageable with said first valve seat in the closed position of the valve assembly, a second portion engageable with said second valve seat in said closed position and a flexible sidewardly extending connection portion between the first and second portions forming a space on one side of the clapper portion along and bridging the annular space therebetween to permit limited unrestricted relative movement between the inner and outer members without stretching the valve seal member, said valve assembly including cooperatively engageable interlocking members on said inner and outer clapper members to limit relative rotational movement therebetween.

4,249,569

LOAD RESPONSIVE FLUID CONTROL VALVE

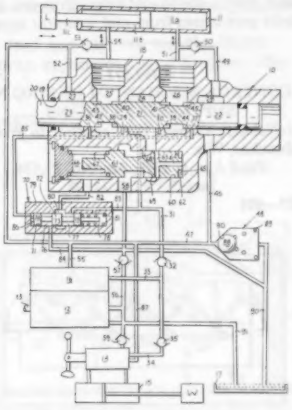
Tadeusz Budzich, 80 Murwood Dr., Moreland Hills, Ohio 44022

Continuation-in-part of Ser. No. 949,250, Oct. 6, 1978. This application Jun. 18, 1979, Ser. No. 49,796

Int. Cl.³ F15B *13/08*

U.S. Cl. 137—596.2 **8 Claims**

1. A valve assembly supplied with pressure fluid by a pump, said valve assembly comprising a housing having a fluid inlet chamber, a fluid supply chamber, first and second load chambers, positive load pressure sensing means, negative load pressure sensing means, and exhaust means, first valve means for selectively interconnecting said fluid load chambers with said positive load pressure sensing means and said negative load pressure sensing means, said supply chamber and said exhaust means, first variable metering orifice means responsive to movement of said first valve means between said fluid supply chamber and said load chambers, second variable metering orifice means responsive to movement of said first valve means between said load chambers and said exhaust means, second valve means having inlet fluid throttling means between said fluid inlet chamber and said fluid supply chamber, said second valve means including a first force generating means having means responsive to fluid pressure in said positive load pressure sensing means, and a second force generating means having means responsive to pressure in said supply chamber, first spring biasing means opposing said second force generating means and third valve means having means selectively operable to connect said first force generating means with said reservoir means said third valve means having means responsive to pressure in said negative load pressure sensing means,



and second spring biasing means opposing said means responsive to pressure in said negative load pressure sensing means.

4,249,570

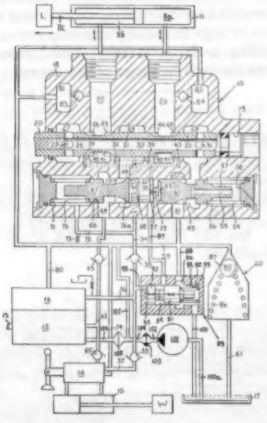
EXHAUST PRESSURIZATION OF LOAD RESPONSIVE SYSTEM

Tadeusz Budzich, 80 Murwood Dr., Moreland Hills,, Ohio 44022

Continuation-in-part of Ser. No. 960,767, Nov. 15, 1978, and Ser. No. 949,250, Oct. 6, 1978. This application Jun. 18, 1979, Ser. No. 49,660

Int. Cl.³ F15B *13/08*

U.S. Cl. 137—596.13 **28 Claims**



1. A valve assembly supplied with pressure fluid by a pump having inlet port means and outlet port means, said valve assembly comprising a housing having a fluid inlet chamber connected to said outlet port means, at least one load chamber, and exhaust means connected to reservoir means, first valve means for selectively interconnecting said load chamber with said inlet chamber and said exhaust means, signal port means in said housing selectively communicable with a source of pressure by said first valve means, charging pump means interposed between said reservoir means and said inlet port means

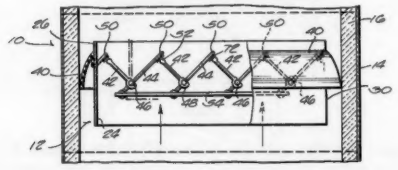
and second valve means interposed between said inlet port means and said reservoir means having means responsive to pressure in said signal port means and operable to either connect said inlet port means to said reservoir means or to disconnect said inlet port means from said reservoir means.

4,249,571

AIR CONTROL MECHANISM HAVING NOISE SUPPRESSION MEANS

John C. McNabney, Verona, Wis., assignor to Wehr Corporation, Milwaukee, Wis.

Filed Apr. 6, 1979, Ser. No. 27,674
Int. Cl.³ F23L *13/08*
U.S. Cl. 137—601 **8 Claims**



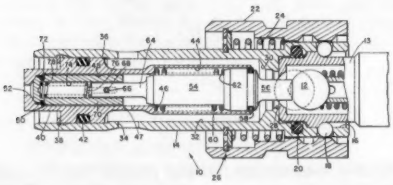
1. An air flow control mechanism for use in an air duct for controlling air flow through the duct, the air flow control mechanism comprising a rectangular frame positionable in the duct, the frame defining a plane transverse to the direction of air flow through the duct, a member supported by said frame and having a first flow controlling surface, a movable member supported by said frame and having a second flow controlling surface, said movable member being pivotably supported so that said second flow controlling surface moves through a range of movement toward and away from said first flow controlling surface, means for pivoting said movable member so that said second flow controlling surface moves toward and away from said first flow controlling surface, and means for preventing the formation of high frequency noise caused by air flow between said flow controlling surfaces and for preventing the formation of high frequency standing waves between said flow controlling surfaces as said second movable member surface moves through its range of movement.

4,249,572

SELF-RELIEVING FLUID COUPLING

Aloysius C. Shindelar, Hudson, Iowa, and Deere & Company, 02, Moline, Ill.

Continuation of Ser. No. 927,462, Jul. 24, 1978. This application Feb. 4, 1980, Ser. No. 118,267
Int. Cl.³ F16L *37/00*; F16K *51/00*
U.S. Cl. 137—614.04 **4 Claims**



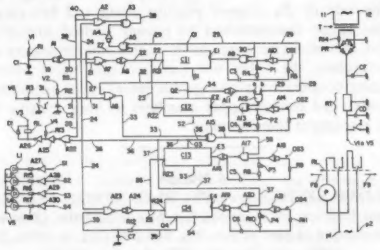
1. A female coupler for coupling and uncoupling to and from a longitudinally extending male coupler having a longitudinal through passage provided therein and a check member disposed in the through passage for limited movement between closed and open positions to respectively block and unblock the through passage, comprising: a receptacle member having an engagement bore provided therein for receiving the male coupler, said receptacle member having a main bore provided therein connected to the engagement bore, said receptacle member having main and secondary ports provided therein connected to the main bore, a main poppet valve movably disposed in the main bore, biasing means yieldably urging the main poppet valve to a normal closed position blocking the main bore from the engagement bore, the main poppet valve having a stem projecting into the engagement bore for engagement with and movement by the check member of the male coupler as the male coupler is inserted into the engagement bore with sufficient force to overcome the main poppet valve biasing means, whereby said main poppet valve is moved by the check member to an open position when the male coupler is inserted into the engagement bore, a secondary poppet valve movably disposed in the main bore, means within the main bore biasing the secondary poppet valve to a closed position blocking the main bore from the secondary port when said couplers are coupled, and means connecting the secondary poppet valve to the main poppet valve for moving said secondary poppet valve towards an open position unblocking the main bore from the secondary port as the main poppet valve moves to the closed position.

4,249,573

PROGRAMMED-SEQUENCE FLUID DISTRIBUTOR FOR USE IN FEED AND MAINTENANCE OF DETERGENT CONCENTRATION IN THE WASHING BATH OF A DISH-WASHING MACHINE OR THE LIKE

Rene G. Chevallier, Annemasse, France, assignor to Odev S.A., Geneva, Switzerland

Filed Sep. 20, 1978, Ser. No. 943,763
Claims priority, application Switzerland, Sep. 21, 1977, 11581/77
Int. Cl.³ B08B *3/00*
U.S. Cl. 137—624.2 **8 Claims**



1. A programmed sequence fluid distributor comprising a fluid source, a conduit system for moving said fluid to a desired location, fluid movement control means for controlling the movement of the fluid in dependence upon a programmed sequence and a sequential programming means for, in dependence upon the programmed sequence, controlling the actuation and de-actuation of the said fluid movement control means, said sequential programming means comprising an electronic circuit comprising at least two stages, each said stage comprising a binary pulse generating RC oscillator including a resistor branch having a potentiometer therein for regulating the oscillation frequency of the said oscillator and for setting the duration of a cycle, said cycle being completed when the said fluid movement control means is actuated or de-actuated, and a binary pulse counter connected to said oscillator for counting the pulses received from said oscillator and for producing a predetermined output when the counter counts a fixed number of said pulses, the duration of said counting by said counter being equal to the duration of the cycle, and the predetermined output of the counter of the first stage causing blocking of the oscillator of said first stage and initiating the operation of the oscillator of the second stage during the second cycle, said oscillator of the second stage, at the end

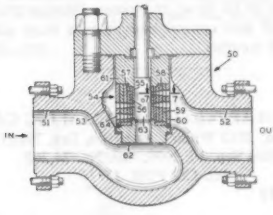
of said second cycle and after the counting of the pulses produced thereby by the counter of said second stage, being blocked by the switching of the output of said second stage counter; said electronic circuit further comprising a power stage and a relay for commanding the actuation or de-actuation of the said fluid movement control means during a said cycle, said power stage controlling energization of said relay so as to maintain or not maintain the excitation of the coil of said relay according to the input to said power stage during the cycle, said electronic circuit including binary logic circuit for controlling the input to said power stage responsive to the output of the counter of the stage that is actuated during the said cycle; said electronic circuit further comprising a flip-flop circuit for providing resetting to zero of the counters of the different stages.

4,249,574

ORIFICE TRIM AND BACKPRESSURE PLATE FOR HIGH PRESSURE VALVES

Ira H. Schnall, Erie, Pa., and Walter W. Mott, Sandway, Nr. Northwich, England, assignors to Copes-Vulcan, Lake City, Pa.

Filed Mar. 9, 1978, Ser. No. 884,913
Int. Cl.³ F16K *47/14*
U.S. Cl. 137—625.3 **2 Claims**



1. In a passage-forming means for high pressure fluid flow, means to provide a controlled, gradual dissipation of fluid energy comprising

(a) a plurality of contacting, rigid mating parts arranged across the flow path of said passage-forming means, and

(b) fluid flow openings formed through and spaced across each of said parts to define flow through spaces for the fluid,

(c) each of said openings including width and length dimensions of predetermined value such that each of said fluid flow openings acts as an expansion chamber for the fluid flowing therethrough,

(d) each of the fluid flow openings of each of the mating parts being of uniform dimensions throughout the thickness of the part,

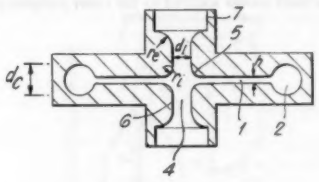
(e) the centerpoint of each of the fluid flow openings lying at the vertex of an imaginary equilateral triangle with the centerpoints of two adjacent fluid flow openings being arranged at the other vertices of said equilateral triangle, whereby each opening overlaps three openings of a contiguous part to provide a continuous dividing of the fluid flow as it flows from each opening to the three openings of the contiguous part which are in an overlapping relation thereto.

4,249,575

FLUIDIC DEVICES

Nicholas Syred, and Peter J. Roberts, both of Cardiff, Wales, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Apr. 11, 1979, Ser. No. 29,103
Claims priority, application United Kingdom, May 11, 1978, 19049/78
Int. Cl.³ F15C *1/16*
U.S. Cl. 137—812 **6 Claims**



1. In a vortex diode comprising a cylindrical vortex chamber having an enlarged peripheral channel, at least one tangential port leading into the peripheral channel, an axial port, and geometric parameters as follows:

(a) the diameter of the or each tangential port (d_t) at the region of merger with the peripheral channel is substantially equal to the diameter of the channel,

(b) the ratio of the radius of curvature at the junction of the or each tangential port with the peripheral channel (r_t) and the diameter of the or each tangential port (d_t) is such that r_t/d_t is in the range 0.5 to 2,

(c) the ratio of the radius of curvature at the junction between the axial port and the vortex chamber (r_i) and the diameter of said port (d_i) is such that r_i/d_i is in the range 0.3 to 3,

(d) the ratio of the radius of curvature at the junction of the axial port with a flow passage remote from the vortex chamber (r_e) and the diameter of the axial port (d_i) is such that r_e/d_i is in the range 0.3 to 4,

(e) the ratio of the total cross sectional areas of the tangential and axial ports (A_t and A_i respectively) is such that A_t/A_i is in the range 0.5 to 2,

the improvement which comprises a second axial port so arranged that the two such ports are in axial alignment extending oppositely away from the vortex chamber and are alike in size and geometric parameters, the height of the cylindrical vortex chamber (h) being less than 0.75 times the axial port diameter (d_i), and the ratio of the overall diameter of the vortex chamber (d_c) and the axial port diameter (d_i) being such that d_c/d_i is in the range 8 to 20.

4,249,576

RETRIEVABLE PLUG FOR OFFSHORE PLATFORMS HAVING SHEAR TYPE RETAINING MEANS

Steven G. Streich; L. Carter Knox, and Bob L. Sullaway, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Division of Ser. No. 906,900, May 18, 1978, Pat. No. 4,184,515.
This application Jul. 30, 1979, Ser. No. 61,566
Int. Cl.³ F16L *55/12*; E21B *33/12*
U.S. Cl. 138—89 **1 Claim**

1. A plug for sealing the interior of a hollow cylindrical member to prevent the flow of fluid therethrough, said plug releasably secured within said hollow cylindrical member being removable therefrom by the application of a first force and a larger second force thereto, said plug comprising:

cylindrical housing means connected to said hollow cylindrical member, said cylindrical housing means comprising:

hollow cylindrical means having a first interior annular

chamfered surface, having a first cylindrical interior surface, having a second interior annular chamfered surface, having a second cylindrical interior surface, having an exterior cylindrical surface and having a plurality of apertures in the exterior cylindrical surface extending into the second cylindrical interior surface;

central body means releasably secured to said cylindrical housing in sealing engagement with an interior surface of said cylindrical housing means, said central body means comprising:

dished circular plug means having a central opening therein;

annular wall means secured to the outer periphery of the dished circular plug means, the annular wall means having seal cavity means in the outer surface thereof, having annular seal means installed in the seal cavity means sealingly engaging the second cylindrical interior surface of said cylindrical housing means and having aperture means located in the outer surface thereof extending through a portion of the thickness of the annular wall means;

hollow cylindrical body means secured about the periphery of the central opening of the dished circular plug means, the hollow cylindrical body means having aperture means extending through the wall thereof; and

a plurality of lifting means secured to the dished circular plug means to allow the removal of said plug from the interior of said hollow cylindrical member, each lifting means of the plurality of lifting means having a portion thereof secured to the dished circular plug means and having aperture means in another portion thereof;

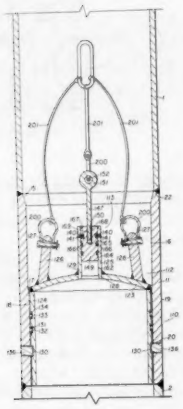
pressure equalization means for allowing the pressure of said fluid to equalize across said central body means before the removal thereof from said cylindrical housing means to allow the flow of said fluid through said hollow cylindrical member, said pressure equalization means comprising:

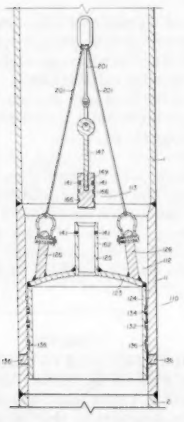
plug means releasably secured to the hollow cylindrical body means of said central body means having seal cavity means in the outer surface thereof, having annular seal means installed in the seal cavity means in the outer surface of the plug means sealingly engaging the interior of the hollow cylindrical body means, and having aperture means in the outer surface thereof; and

rod means secured to the plug means to release said plug means from said sleeve means when a force is applied to said rod means;

first shear pin means having a portion thereof releasably secured within the apertures in the hollow cylindrical body means secured about the periphery of the central opening of the dished circular plug means and having a portion thereof extending into the aperture means in the outer surface of the plug means of the pressure equalization means to releasably secure the plug means to the hollow cylindrical body means, said first shear pin means being sheared by the application of said first force; and

second shear pin means having a portion thereof releasably secured within the apertures of said cylindrical housing means and having a portion thereof extending into the apertures located in the outer surface of the annular wall means of said central body means to releasably secure said central body means within the said cylindrical housing means, said second shear pin means requiring said larger second force to shear the same, thereby allowing the removal of said central body means from said hollow cylindrical member.





4,249,577

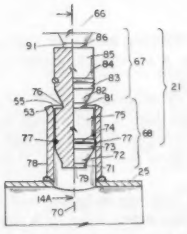
PROCESS AND APPARATUS FOR SEALING GAS LINES

James W. Davis, 2013 Walker, Amarillo, Tex. 79107

Filed Sep. 10, 1979, Ser. No. 74,242

Int. Cl.[3] **F16L** *55/10*

U.S. Cl. 138—92 **8 Claims**



5. Apparatus for sealing a steel branch line comprising, in combination,

(a) a multiple permanent plug unit assembly comprising a plurality of like permanent plug units firmly joined together in series, each of said plug units being identical and formed of steel with less than 0.25% carbon, each permanent plug unit being an axially symmetrical rigid structure circular in crossection transverse to a longitudinally extending axis of symmetry, each permanent plug unit having a lower permanent plug unit interunit cylindrical unit portion and, firmly connected thereto and thereabove, a permanent plug unit frusto-conical portion, and there-

above and firmly connected thereto, a cylindrical permanent plug body lower portion which is continuous with an annular plug body groove thereabove and, thereabove, a cylindrical permanent plug body upper portion, the cylindrical upper portion terminating in a permanent plug unit upper shoulder surface, the diameters of said plug body lower and upper portions and being of the same size, each permanent plug shoulder surface being a flat annulus and connected through a permanent plug assembly interunit connector to a like permanent plug unit in said series, and

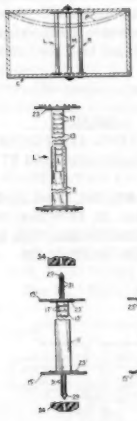
(b) a resilient temporary sealing anchor ring, said anchor ring having an exterior diameter larger than the external diameter of said body of said permanent plug units and a thickness less than the length of said annular plug body grooves measured along the axis of symmetry of said permanent plug units and a width which is greater than the depth of said annular grooves measured perpendicular to said axis of symmetry of said permanent plug units.

4,249,578

LENGTH-ADJUSTABLE STIFFENER FOR FIBERBOARD DUCTS

James D. Freeman, 11 W. Grand Ct., Springfield, Ill. 62704

Filed May 29, 1979, Ser. No. 43,362
Int. Cl.³ F16L 9/04
U.S. Cl. 138—172 **9 Claims**



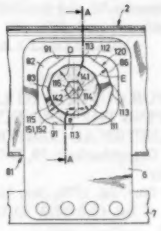
1. In the combination of a fiberboard airduct and at least one space-bridging brace transversely disposed therein, said brace being the improvement and comprising: a pair of telescopically mating rods, manually operable means interactuable between said rods for locking them in length-adjusted relative positions, large-area transaxially extending flange-like means fixed to and short of the ends of said rods for bracingly engaging against the inner surfaces of opposed duct panels, and at least one thin duct-panel-penetrating finger extending beyond the outer faces of each of said flange-like means.

4,249,579

SHAFT FOR A WEAVING MACHINE

Hans Baumann, Horgen, Switzerland, and Hartmann Bader, Bad Liebenzell, Fed. Rep. of Germany, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Feb. 5, 1979, Ser. No. 9,493
Claims priority, application Switzerland, Feb. 7, 1978, 1340/78
Int. Cl.³ D03C 9/06
U.S. Cl. 139—92 **15 Claims**



1. In combination,

a shaft having a pair of longitudinally disposed opposed side walls and at least one cross bar interconnecting said walls to define an enclosed space;

a retaining element extending from said space of said shaft and having an aperture therein disposed within said space; and

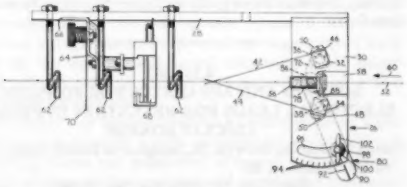
an intermediate element securing said retaining element in said shaft between said walls, said intermediate element including a first inner member rotatably mounted in at least one of said walls of said shaft and extending through said retaining element and a second ring shaped member disposed about said inner member within said aperture of said retaining element for rotation with said inner member, said second member having an eccentric outer surface in engagement with said retaining element.

4,249,580

WEFT CONTROL DEVICE

Edward S. Budzyna, Tallahasse, Fla., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Sep. 20, 1979, Ser. No. 77,203
Int. Cl.³ D03D 47/34
U.S. Cl. 139—450 **3 Claims**



1. A weft control device for looms of the shuttleless type wherein weft drawn from a stationary source is presented to an inserting member and inserted into sheds of warp threads, said device comprising:

(a) a support means fixed on the loom intermediate the weft source and warp threads;

(b) a pair of spaced post elements mounted on said support means including:

(i) a spring biased friction plate attached to each of said post elements and disposed for engagement one with the other for applying tension to the weft therebetween;

(c) means for rotating said post elements in opposite directions to any one of a plurality of predetermined positions for varying the forces with which said friction plates engage the weft including:

(i) a first control lever fixed on one end of one of said post elements;

(ii) a second control lever fixed intermediate its ends to one end of the other of said post elements having:

(a) an outer end defining an indicating arm for selectively rotating its respective post elements; and

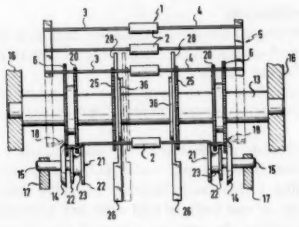
(d) means interconnecting said first and second control levers for effecting simultaneous rotative movement of said post elements during selective movement of said indicating arm.

4,249,581

APPARATUS FOR CUTTING TO LENGTH, BENDING AND CRIMPING THE CONNECTING WIRES OF ELECTRICAL COMPONENTS

Thomas Weresch, Greschbachstr. 19, D-7500 Karlsruhe 41, Fed. Rep. of Germany

Filed Nov. 24, 1978, Ser. No. 963,219
Int. Cl.³ B21F *45/00*
U.S. Cl. 140—105 **4 Claims**



1. In a device for cutting to length, crimping and bending of lead wires extending from electrical components of the type having transport sprocket wheels mounted upon a rotatable shaft, bending means for bending said leads, at least one corrugating sprocket wheel with a plurality of teeth and spaces therebetween mounted on said shaft between each transport sprocket wheel and a neighboring bending means, and corrugating tool means for cooperating with said corrugating sprocket wheels to corrugate said leads, the improvement comprising retaining means for preventing rotation of corrugated leads relative to said sprocket wheels to properly orient said leads for subsequent bending thereof, said retaining means being formed by radially arranged grooves on at least one side surface of said corrugating sprocket wheels, said grooves opening into each tooth space and extending radially inwardly therefrom.

4,249,582

METHOD AND APPARATUS FOR FORMING ELECTRICAL LEADS FOR RETENTION IN PRINTED CIRCUIT BOARDS

Joseph M. Jacobs, Berwyn, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Sep. 18, 1979, Ser. No. 76,645
Int. Cl.³ B21F *1/00*
U.S. Cl. 140—105 **1 Claim**

1. Apparatus for forming a J-hook on an end of an insulated electrical lead for retention of said lead by a printed circuit board having at least one hole therethrough in association with an impressed electrical terminal, the metallic wire of said lead projecting a predetermined length from an abutment of the insulation of said lead formed by a stripping process, said apparatus comprising in combination:

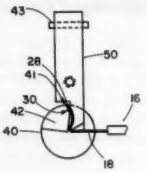
entry means providing for insertion of said lead into a wire forming station in said apparatus, said wire when in said station lying substantially diametrically to the face of a rotary forming die, and adjacent to the plane of the face of said die, with the tip of said wire extending appreciably beyond the periphery of said die;

cradle means extending from said face for receiving said wire, said cradle means having a chamfer adjacent to said tip of said wire;

anvil means suspended by pivot means adjacent to said face of said die, said anvil means having a wire forming concavity lying in the plane of said wire and substantially orthogonal to the axis of said rotary forming die;

wire clamping means associated with said entry means for clamping said wire in said work station;

means for rotating said die and said cradle from a first position to a second position to form an approximately 90° fold in said wire, said cradle forcing said wire into said



concavity of said anvil, with said chamfer providing for the relief of said tip from said force to form a spur projecting outwardly from said wire on said tip of said wire;

means for rotating said anvil on said pivot means to retract said anvil from said work station;

means for rotating said die and said cradle to a third position to fold said wire into a narrow J-hook, the folded width of which is slightly greater than the diameter of said hole in said printed circuit board;

means for releasing said lead from said wire clamping means, providing for withdrawal of said lead from said apparatus;

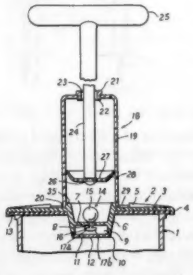
means for returning said rotary forming die to said first position and restoring said anvil to said work station, whereupon said apparatus is ready to form another J-hook on an end of an electrical lead for retention by a printed circuit board.

4,249,583

DEVICE FOR EVACUATING AIR FROM A CONTAINER

Tage S. Lundbladh, 85 Vilgergagatan, 603 57 Norrkoping, Sweden

Continuation of Ser. No. 853,964, Nov. 22, 1977, abandoned. This application Jul. 26, 1979, Ser. No. 61,081
Claims priority, application Sweden, Sep. 16, 1977, 7710400
Int. Cl.³ B65B *31/04*
U.S. Cl. 141—65 **7 Claims**



1. In a device, for evacuating air from a container having an

opening, of the kind comprising (a) a cover provided with a sealing surface to sealingly engage part of said container which surrounds said opening, said cover having an opening which is closable by means of a valve, and (b) a separable evacuating pump having a cylinder for connection to said cover for evacuating air from said container, the improvement that:

(i) said pump has a plunger including a circular part having an annular sealing lip which is frustoconical and diverges in the direction of movement of the plunger to cause suction, said plunger being made from a resilient plastics material and having such wall-thickness that said sealing lip during the suction stroke is resiliently pressed against the internal face of said cylinder, and during a compression stroke may be deformed by air pressure such that air may pass out of the cylinder between said lip and the cylinder wall;

(ii) said pump cylinder is made from a resilient plastics material;

(iii) said pump cylinder has at a free end thereof in a thin annular lip;

(iv) said cover has on an upper face thereof an annular flange surrounding said opening of the cover, said annular flange serving to sealingly cooperate with said thin annular lip of the pump cylinder when said pump is pressed axially against the cover;

to provide centering of the pump cylinder in relation to the cover and sealing therewith in two planes substantially perpendicular to each other;

(v) wherein said valve has a valve member with a ball-shaped part having a downwardly directed stem to pass with clearance through an opening of a wall of the cover, and two projections projecting from said stem in two opposite directions, said projections being normally located below said wall, the distance between the ends of said projections exceeding the diameter of the hole in the cover so as to prevent unintended removal of said valve, said wall in which said hole is provided having a substantially planar upper surface, said opening being cylindrical and having a comparatively narrow dimension compared to said ball-shaped part such that a major part of said ball-shaped part remains easily accessible above said wall, said valve member being made from a material having such resiliently yielding properties that said ball-shaped part can provide sufficient sealing against said wall surrounding said opening of the cover mainly by linear contact, whereas the projections may be yieldingly deformed for insertion and removal of the valve.

4,249,584

CARPENTER PLANER

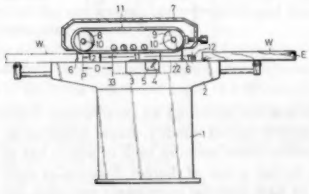
Hirotsugu Onda, Seki, Japan, assignor to Onda Ironworks Company, Ltd., Seki, Japan

Filed Jul. 6, 1979, Ser. No. 55,299

Claims priority, application Japan, Jul. 13, 1978, 53-96958[U]; Jul. 14, 1978, 53-97791[U]

Int. Cl.³ B27C *1/00*

U.S. Cl. 144—120 **7 Claims**



1. A carpenter planer comprising a stock feeder table mounted on a base, a stock feeder vertically adjustably positioned on said table, means for operating said stock feeder to selectively enable feeding of stock in first and second opposite directions on said table, a rotary disc on said table, a planing blade positioned in said disc to cut stock fed thereto by said stock feeder, whereby said planing blade is rotatable with said disc to separate cutting positions corresponding to the feeding of stock in said first and second directions respectively, and control means coupled to control the feed of said stock feeder and to rotate said disc, whereby time lags occur between changing of direction of feed and the rotation of said disc.

4,249,585

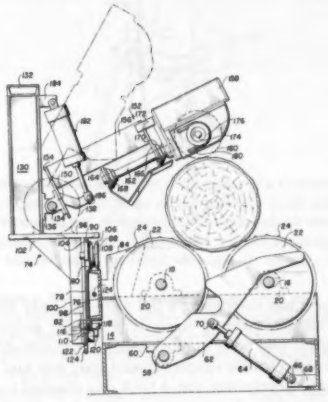
LOG DEBARKING APPARATUS

Hayes R. Mellott, 13529 Long La., Mercersburg, Pa. 17236

Filed Apr. 19, 1979, Ser. No. 31,636

Int. Cl.³ B27L *1/04*

U.S. Cl. 144—208 G **15 Claims**



1. A log debarking apparatus comprising,

an elongated rigid structural frame,

log supporting and turning means on said structural frame for supporting a log at a substantially fixed location while rotating the log about its axis,

a driven rotary debarking tool for removing bark from a log being rotated on said supporting and turning means,

a debarker tool carriage supporting the debarking tool for movement along the length of a log being rotated on the log supporting and turning means,

track means for supporting the carriage for movement along a path substantially parallel to and spaced from a log on said log supporting and turning means,

said track means including an elongated structural member extending along one side of said structural frame and having a single upwardly directed carriage support track on its top surface, and lateral stabilizing guide means extending parallel to and spaced substantially below said carriage support track,

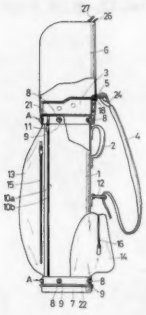
said debarker tool carriage including a carriage frame, a pair of carriage support wheels mounted in tandem on said carriage frame and positioned to engage said single carriage support track to support said carriage for movement therealong, movable tool support arm means mounted on said carriage frame above said carriage support wheels and projecting laterally from said track means in position to support the debarker tool above said structural frame, and guide follower means on said carriage frame and engaging said lateral stabilizing guide means, said lateral stabilizing guide means and said guide follower means cooperating with said single carriage support track and said carriage support wheel to provide the sole support for said carriage and stabilize the carriage against tilting movement about said single carriage support track, and

means for driving the carriage along said carriage support track.

4,249,586
GOLF BAG

Yosuke Setani, 3-8, 3-chome, Koji-machi, Chiyoda-ku, Tokyo, Japan

Filed Sep. 10, 1979, Ser. No. 73,641
Claims priority, application Japan, Sep. 13, 1978, 53-125761[U]
Int. Cl.³ A63B *55/00*
U.S. Cl. 150—1.5 C **3 Claims**



1. A golf bag comprising a flat plate-like body having top, bottom and side edges, a zipper slide fastener secured to said side edges of said body to retain said body in cylindrical form when closed, a handle attached to said body near said top edge, a top end form-retention ring, a hook ring attached to the outer peripheral surface of said top ring, a dish-shaped bottom member, a cover sheet for covering golf club heads projecting from said top end form-retention ring, fastener means to detachably connect said top end form-retention ring, bottom member and cover sheet to said body comprising projections on the peripheral surfaces of said top end form-retention ring and bottom member and cooperating connecting rings on said top and bottom edges of said body and on said cover through which said projections are removably insertable, a belt-type buckle secured to the outer surface of said body substantially at the central portion thereof, and a shoulder strap having a snap hook at one end for engaging said hook ring and a belt-type portion at the other end for engaging with said buckle.

4,249,587
BICYCLE TIRE WITH IMPROVED REINFORCING STRIP

Jean C. Duttlinger, Soissons, France, assignor to Wolber, Soissons, France

Continuation-in-part of Ser. No. 785,295, Apr. 6, 1977, abandoned. This application Feb. 16, 1979, Ser. No. 12,899
Claims priority, application France, Feb. 14, 1977, 77 04080
Int. Cl.³ B60C *9/18*
U.S. Cl. 152—354 R **7 Claims**

1. A puncture resistant cycle tire comprising:
a cycle tire casing having attached thereto a tread;
a penetration resistant puncture preventing structure means positioned between said tread and casing, said puncture preventing structure means comprising a prefabricated assembly of high tensile strength threads in the form of an open mesh knitted sheath or tubular member, said sheath or tubular member having a transverse cross section, along a plane extending axially of said tire, in the form of a completely enclosed and endless configuration; and
said tire being vulcanized such that rubber from at least one of said casing and said tread penetrates into the open meshes of said puncture preventing structure means,

thereby intimately bonding said puncture preventing structure means to said rubber.

4,249,588
PNEUMATIC TIRE

William E. Egan, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

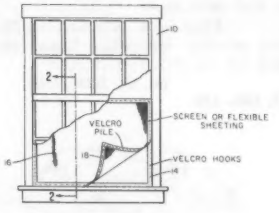
Filed Apr. 27, 1978, Ser. No. 900,458
Int. Cl.³ B60C *5/00*
U.S. Cl. 152—357 R **3 Claims**

1. A pneumatic rubber tire having, as its outer ground contacting portion and at least a part of its outer sidewall portion, an integral, resilient, covulcanized, closed cell rubber structure, said closed cell structure having a thickness in the range of about 0.25 to about one inch and characterized by having a compressability in the range of about 1 to about 800 psi at 25° C.

4,249,589
APPARATUS FOR MOUNTING AN ENVIRONMENT CONTROLLING SHEET

Nackey S. Loeb, Prides Crossing, Mass. 01965

Continuation of Ser. No. 932,269, Aug. 9, 1978, abandoned. This application Aug. 30, 1979, Ser. No. 70,925
Int. Cl.³ E06B *3/00*
U.S. Cl. 160—368 R **1 Claim**



1. Apparatus for mounting an environment controlling barrier on a double sashed window frame comprising:
four separate frame sections each of which has an elongated body having a pair of flanges disposed at right angles;
a layer of base material completely covering the outer surface of one flange of each said frame section;
a multiplicity of small hooks embedded in said base material along the full length thereof on each frame section;
separate means for directly securing one frame section to the base of said window frame outside of but adjacent to the

plane of the outermost sash and with the hooks facing inwardly;

separate means for directly securing one said frame section at each side of said window frame in abutting relation with the frame section at the base and with the flange thereof having the hooks thereon facing inwardly and likewise lying adjacent to the plane of the outermost sash, and in abutting relation with the base material of the adjacent frame section;

separate means for directly securing the fourth frame section across the window frame at the midpoint thereof in abutting relation with the tops of the frame sections secured to the sides and with the flange having the hooks thereon facing inwardly and likewise lying adjacent to the plane of the outermost sash, and in abutting relation with the base material of the adjacent frame sections;

a flexible environment controlling barrier dimensioned to overlap said frame sections in said window frame;

elongated strips of fibrous pile material affixed to each margin of said barrier;

said pile material in interlocking engagement with said hooks and in abutting relation at the corners formed by said frame sections; and

the lower edge of the outermost sash in abutting relation with the inner upper margin of said barrier.

4,249,590

METHOD FOR CONTINUOUS CASTING

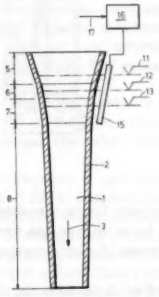
Fritz Willim, Birmensdorf, Switzerland, assignor to Concast AG, Zurich, Switzerland

Filed Mar. 22, 1978, Ser. No. 889,096

Claims priority, application Switzerland, Apr. 6, 1977, 4351/77

Int. Cl.³ B22D *11/04, 11/16*

U.S. Cl. 164—82 **8 Claims**



1. A method of continuously casting metals, especially steel, while taking into account for the cast metal different possible casting parameters, such as composition of the cast metal, temperature of the cast metal, casting speed and casting process, comprising the steps of:

providing a continuous casting mold having a hollow mold compartment and having at least two successive taper stages of differing degrees of taper in a direction of travel of the metal through the continuous casting mold;

continuously casting metal into the continuous casting mold to establish a molten both level in the mold and to form a continuously cast strand; and

altering the height of the molten bath level in the continuous casting mold from one taper stage to another and different taper stage in order to accommodate the shrinkage behaviour of the strand which is being formed to different casting parameters of the cast metal, so that with the same continuous casting mold it is possible to cast metal at different casting parameters without the need to alter the dimensions of said hollow mold compartment of said casting mold.

4,249,591

APPARATUS FOR MAKING DENTAL BRIDGEWORK

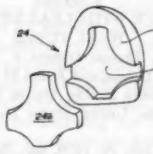
Larry C. Been, 4335 Bonham, Dallas, Tex. 75229

Continuation of Ser. No. 811,427, Jun. 29, 1977, Pat. No. 4,176,706. This application Jun. 14, 1979, Ser. No. 48,358

The portion of the term of this patent subsequent to Dec. 4, 1996, has been disclaimed.

Int. Cl.³ B22C *7/02*; A61C *13/10*

U.S. Cl. 164—246 **8 Claims**



1. Pattern apparatus for use in the making of a framework for a dental bridge by use of a die of the patient's teeth which has a gap between shaped abutment teeth upon which temporary crown patterns have been formed, the pattern apparatus comprising a tooth-shaped member adapted to fit into the gap including:

a temporary rigid insert having spaced apart end surfaces dimensioned for being adhesively joined to said crown patterns, said insert formed of a material capable of being vaporized at a temperature less than the melting temperature of gypsum-based plaster, and

a facing member having a groove on the lingual side thereof dimensioned to receive said insert, said facing member removably attached to said insert.

4,249,592

HIGH TEMPERATURE, HEAT STORAGE AND RETRIEVAL SYSTEM

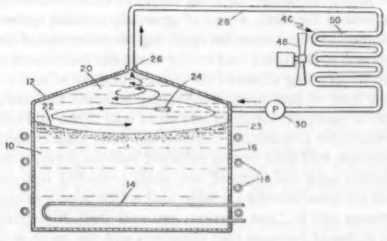
Norman D. Greene, Del Mar, Calif., assignor to Kohler Co., Kohler, Wis.

Filed Dec. 21, 1978, Ser. No. 971,810

The portion of the term of this patent subsequent to Aug. 29, 1995, has been disclaimed.

Int. Cl.³ F28D *21/00*

U.S. Cl. 165—1 **23 Claims**



1. The method of storing energy and retrieving such stored energy as heat, that includes

(a) providing a liquid system that consists essentially of a salt melt lower region, an upper region of additive liquid which is immiscible with the salt melt, said liquid being metallic, and an emulsion of said melt and additive liquid intermediate said upper and lower regions,

(b) effecting latent heat transfer from the melt to the additive

liquid within the emulsion, and transferring heat from the additive liquid,

(c) maintaining active flowing movement of the emulsion to enhance said latent heat transfer, and which results in formation of salt crystals, and

(d) gravitating said crystals downwardly in the melt away from the emulsion.

4,249,593

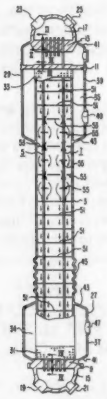
HEAT EXCHANGER WITH LEAK DETECTING DOUBLE WALL TUBES

George Bieberbach, Tampa; Donald J. Bongaards, Seminole; Alfred Lohmeier, Tampa, and James M. Duke, St. Petersburg, all of Fla., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 19, 1979, Ser. No. 4,634

Int. Cl.[2] F28F *9/02*

U.S. Cl. 165—70 **5 Claims**



1. A heat exchanger for transferring heat from a primary fluid to a secondary fluid, said heat exchanger comprising a shell, a plurality of double wall tubes with at least one groove at the interface of the two walls, a single tubesheet having a plurality of holes for receiving one end of the tubes disposed at one end of the shell, a pair of generally parallel spaced apart tubesheets having holes for receiving the other end of the tubes disposed at the other end of the shell, the outer wall of each tube terminating adjacent the inner tubesheet of said pair, the inner wall of said tubes terminating adjacent the outer tubesheet of said pair, the inner and outer wall of the said other end of said tubes terminating adjacent the outer edge of said single tubesheet, said shell having enlarged bulbous portions disposed adjacent each end thereof, said shell extending into said bulbous portions forming a double wall which produces chambers between said bulbous portions and said shell, foraminous collars disposed between said chambers and the inner portion of said shell, each bulbous portions having a nozzle for said primary fluid, one of said primary fluid nozzles being an inlet nozzle, the other being an outlet nozzle, a head disposed on each end of said shell, said heads cooperating with the tubesheets on each end of said shell to form a header for said tubes, one of said heads having an inlet nozzle for said secondary fluid, and the other head having an outlet nozzle for said secondary fluid.

4,249,594

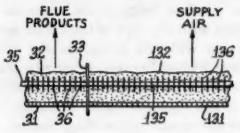
HIGH EFFICIENCY FURNACE

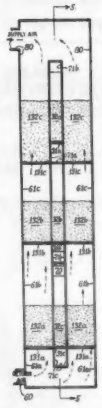
Robert H. Elkins, Hinsdale; Gary M. Durkin, Justice, and Robert A. Macriss, Deerfield, all of Ill., assignors to Southern California Gas Company, Los Angeles, Calif.

Filed Feb. 28, 1979, Ser. No. 16,206

Int. Cl.[3] F28D *13/00*; F22B *23/06*; F28B *7/00*

U.S. Cl. 165—104 F **35 Claims**





1. In a high efficiency furnace, multiple fluidized bed means for heat exchange between two gas streams comprising:

flue gas duct means for conveyance of flue gas from a burner;

a first quantity of solid particles capable of operation at flue gas temperatures of about 200° to about 1200° F. comprising a first fluidized bed within said flue gas duct means;

distributor means for supporting said first fluidized bed and for admitting flue gas thereto and distributing flue gas throughout said first fluidized bed;

air duct means exterior to said flue gas duct means for the portion of its length passing through said first fluidized bed for conveyance of an air stream to be heated for introduction to heat an enclosed volume;

a second quantity of solid particles comprising a second fluidized bed within said air duct means;

distributor means for supporting said second fluidized bed and for admitting air thereto and distributing the air to be heated throughout said second fluidized bed;

thermal exchange means comprising at least one heat pipe in communication with said first and second fluidized beds transferring heat from said first to said second fluidized bed;

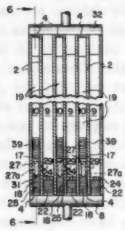
each of said fluidized beds having a depth, when in fluidized state, of about $\frac{1}{2}$ inch to about 4 inches.

4,249,595

PLATE TYPE HEAT EXCHANGER WITH BAR MEANS FOR FLOW CONTROL AND STRUCTURAL SUPPORT

Alan G. Butt, La Crosse, Wis., assignor to The Trane Company, La Crosse, Wis.

Filed Sep. 7, 1979, Ser. No. 73,465
Int. Cl.[3] F28F 3/00
U.S. Cl. 165—110 24 Claims



1. A plate type heat exchanger comprising
a. a plurality of generally planar metallic plates of similar shape, length, and width, arranged in spaced apart, parallel relationship along a common longitudinal axis;
b. first sealing bars for sealingly connecting said metallic plates along the periphery of their facing surfaces, and in conjunction with said metallic plates, defining
i. a plurality of shallow, elongated passages between adjacent facing surfaces of said metallic plates;
ii. first inlet means for admitting a first fluid into first ones of said passages, said first inlet means being disposed adjacent one end of the heat exchanger, and said first passages being non-adjacent to each other;
iii. second inlet means for admitting a second fluid into second ones of said passages, said second inlet means also being disposed adjacent said one end of the heat exchanger, and each of said second passages being adjacent at least one of said first passages, separated by said metallic plates;
iv. outlet means for conveying said first and second fluids in combination out of the heat exchanger, said outlet means being adjacent the other end of the heat exchanger;
c. second sealing bars disposed in said second passages into which said second fluid is admitted and extending between the first sealing bars at opposite edges of said metallic plates, thereby dividing each of said second passages into a second fluid passage connected to the second inlet means on one side and a third fluid passage on the other side of said second sealing bars for conveying a third fluid;
d. first corrugated metallic sheet fins for distributing said first and second fluids substantially uniformly across the width of the heat exchanger;
e. second corrugated metallic sheet fins for distributing said third fluid substantially uniformly across the width of the heat exchanger in said third fluid passages;
f. crossover passages disposed in and passing through the metallic plates separating said first passages conveying said first fluid from said second fluid passages which are adjacent thereto, said crossover passages providing fluid communication between said first passages and said second fluid passages, whereby said second fluid may flow into said first passages, and combine with said first fluid therein, following separate distribution thereof by the first corrugated metallic sheet fins;
g. metallic bars disposed within said second fluid passages generally parallel to and abridging the crossover passages along their length, such that said metallic bars provide substantial support for the metallic plates in that part of the heat exchanger in which the crossover passages are disposed; said metallic bars including a plurality of metering passages which provide fluid communication between said second fluid passages and said crossover passages, and which are operative to restrict the flow of said second fluid through said crossover passages prior to said second fluid mixing with said first fluid in the first passages;
h. third fluid inlet means for admitting a third fluid into the third fluid passages in heat exchange relationship with the combined first and second fluids flowing in said first passages; and
i. third fluid outlet means for conveying the third fluid out of the heat exchanger.

2. A plate type heat exchanger comprising
a. a plurality of generally planar metallic plates of similar shape, length, and width, arranged in spaced apart, parallel relationship along a common longitudinal axis;
b. first sealing means for sealingly connecting said metallic plates along the periphery of their facing surfaces, and in conjunction with said metallic plates, defining
i. a plurality of shallow, elongated passages between adjacent facing surfaces of said metallic plates;
ii. first inlet means for admitting one of a vaporous phase and a liquid phase heat exchange fluids into first ones of said passages, said first inlet means being disposed adjacent one end of the heat exchanger, and said first passages being non-adjacent to each other;
iii. second inlet means for admitting the other of said vaporous phase and said liquid phase heat exchange fluids into second ones of said passages, said inlet means also being disposed adjacent said one end of the heat exchanger, and each of said second passages being adjacent at least one of said first passages, separated by said metallic plates;
iv. outlet means for conveying said vaporous phase and said liquid phase heat exchange fluids in combination out of the heat exchanger, said outlet means being adjacent the other end of the heat exchanger;
c. second sealing means disposed transversely across the longitudinal axis of said metallic plates in said second passages into which said other heat exchange fluid is admitted, said second sealing means extending between the first sealing means at opposite edges of said metallic plates, thereby dividing each of said second passages into an other heat exchange fluid passage connected to the second inlet means on one side and a feed fluid passage on the other side of said second sealing means;
d. first distribution means for distributing said one heat exchange fluid substantially uniformly across the width of the heat exchanger in said first passages;
e. second distribution means for distributing said other heat exchange fluid substantially uniformly across the width of the heat exchanger in said other heat exchange fluid passages;
f. crossover means disposed in and passing through the metallic plates separating said first passages conveying said one heat exchange fluid from said other heat exchange fluid passages which are adjacent thereto, said crossover means being disposed transversely across the longitudinal axis of the metallic plates such that the second inlet means and the crossover means are on the same side of the second sealing means, whereby said other heat exchange fluid may flow into said first passages, and combine with said one heat exchange fluid therein, following distribution thereof by the second and first distribution means, respectively;
g. bar means disposed within said other heat exchange fluid passages generally parallel to and abridging the crossover means along their length, such that said bar means provide substantial support for the metallic plates in that part of the heat exchanger in which the crossover means are disposed and further, by inclusion of means connecting said other heat exchange fluid in fluid communication with said crossover means, are operative to limit and control the flow of said other heat exchange fluid through said crossover means prior to said other heat exchange

fluid mixing with said one heat exchange fluid in the first passages;

h. feed fluid inlet means for admitting a feed fluid into the feed fluid passages in heat exchange relationship with the combined liquid and vaporous heat exchange fluids flowing in said first passages; and

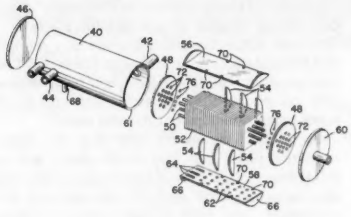
i. feed fluid outlet means for conveying the feed fluid out of the heat exchanger.

4,249,596

CONDENSER AND METHOD OF CONSTRUCTION

Peter Tutak, 210 S. Atlantic Ave., Cheswick, Pa. 15024, and Don Burk, Great Belt Rd., Butler, Pa. 16001

Filed Nov. 13, 1979, Ser. No. 93,451
Int. Cl.³ F28B *9/08*
U.S. Cl. 165—113 **12 Claims**



1. A condenser for separating water and other pollutants from a vaporous mixture and comprises:

a. a cylindrical housing having opposing ends and inlet means and outlet means;

b. sealed and separate conduit means in said housing extending from one toward the other of said opposing ends and having entry and exit means from said housing;

c. heat exchanger fins extending from said conduit means outwardly toward said housing;

d. baffles located in said housing on opposite sides of said heat exchanger fins so as to direct the vaporous mixture alternately from one side to the other of said opposite sides as the vaporous mixture is moved from said inlet means to said outlet means;

e. plate means located below said heat exchanger fins creating a lowermost compartment along the bottom of said housing;

f. perforations formed in said plate means for draining of the water and other pollutants to said lower compartment;

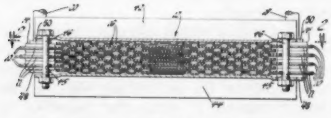
g. means for draining said water and pollutants from said housing.

4,249,597

PLATE TYPE HEAT EXCHANGER

Van P. Carey, North Tonawanda, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed May 7, 1979, Ser. No. 36,346
Int. Cl.³ F28D *9/00;* **F28F** *3/12*
U.S. Cl. 165—166 **3 Claims**



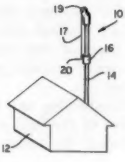
1. A plate of uniform thickness arrangeable with plates of like kind to form a heat exchanger having passages for two fluids separated by an adjoining pair of walls, said plate comprising a planar portion, a series of protuberant channel portions protruding in the same direction from said planar portion, said series including at least two parallel rows extending across the plate, said series divided into three groups extending across said rows comprising first and second groups at opposite end portions of the rows and a third group intermediate said first and second groups, the channel portions in said first and second groups oriented at opposite oblique angles to said rows, and the channel portions in said third group having sides oriented at opposite oblique angles to said rows and having less protuberance than the channel portions in said first and second groups whereby a pair of the plates are arrangeable with their dimple sides facing each other so that their planar portions sealingly abut and the channel portions in their first group cross to interconnect and also the channel portions in their second group cross to interconnect while the channel portions in their third group register to connect the first and second groups to thereby form a sealed fluid passage between the plates and whereby a plurality of pairs of the sealingly abutting plates are also arrangeable in adjoining relationship with their protuberant sides facing each other so that two pairs of sealingly abutting plates have the channel portions in their third group abutting while the channel portions in their first and second groups nest along side each other and abut the opposite planar portion to thereby provide substantial surface-to-surface contact between the pairs of sealingly abutting plates and to form therewith separate fluid passages for two fluids which are separated by two of the plates.

4,249,598

OUTDOOR WELL DEPTH INDICATOR

Henry R. Greer, Rte. 5, Fayetteville, Ga. 30214

Filed Aug. 13, 1979, Ser. No. 65,979
Int. Cl.³ E21B *34/02, 47/04*
U.S. Cl. 166—54 **8 Claims**



1. A well depth indicator comprising:

a vertical support member comprising a hollow pipe mounted above said well;

a pulley mounted on said vertical support member;

a sleeve member slidably received about said vertical support member below said pulley;

a float on the surface of the water in the well; and

an indicator line connected at one end thereof to said float, said indicator line passing through the hollow center of said pipe and around said pulley and being attached at the other end thereof to said sleeve member, whereby said sleeve member moves along said vertical support member responsive to variations in the depth of water in said well.

4,249,599

WELL SAFETY SYSTEM

William F. Krause, Houston, Tex., assignor to Hydril Company, Los Angeles, Calif.

Filed Oct. 29, 1979, Ser. No. 89,184
Int. Cl.³ E21B *34/10, 34/16, 43/12*
U.S. Cl. 166—72 **5 Claims**

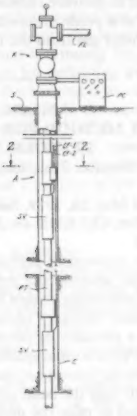
1. A subsurface well safety apparatus for controlling the application of control fluid to surface controlled subsurface safety valves mounted in a production tubing disposed in a well, including:

a flow housing having a flow passage formed therethrough;

means on said flow housing for mounting said flow housing in the production tubing at a subsurface location in the well;

means formed by said housing for receiving control fluid communicated from the surface independent of the well tubing;

means formed by said housing for communicating the control fluid from said housing to a first subsurface safety valve disposed in the well;



means formed by said housing for communicating control fluid from said housing to a second subsurface safety valve disposed in the well; and

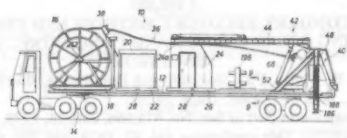
means carried by said housing for movement to and from a first position enabling communication of control fluid from said means for receiving to said means for communicating with the second subsurface safety valve and a second position blocking such communication of the control fluid.

4,249,600

DOUBLE CYLINDER SYSTEM

Thomas F. Bailey, Houston, Tex., assignor to Brown Oil Tools, Inc., Houston, Tex.

Filed Jun. 6, 1978, Ser. No. 913,117
Int. Cl.[3] E21B *19/22*
U.S. Cl. 166—77 **13 Claims**



1. Coiled tubing apparatus for operating on wells comprising:

(a) mast means;

(b) injector means for propelling tubing into or out of a well;

(c) fluid-pressure operated suspension means for supporting said injector means and selectively moving said injector means along said mast means including:

(i) first piston-and-cylinder means with first piston means thereof joined to said mast means at a suspension position so that extension of said first piston means effects movement of first cylinder means of said first piston-and-cylinder means generally away from said suspension position; and

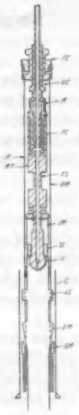
(ii) second piston-and-cylinder means with second cylinder means thereof connected to said first cylinder means and moveable therewith, second piston means of said second piston-and-cylinder means extendable generally away from said suspension position.

4,249,601

HYDRAULIC RUNNING TOOL FOR LINER HANGERS

Pat M. White, 5325 Hendrix, Lewisville, Tex. 75056

Filed Feb. 6, 1979, Ser. No. 9,861
Int. Cl.[3] E21B *23/00*
U.S. Cl. 166—208 **16 Claims**



1. A running and setting tool for a well liner hanger wherein the hanger comprises a pair of movable tubular members and gripping means actuated by relative movement of said members, said tool including,

a tubular support,

means connecting the support to both of the movable tubular members of the liner hanger and being selectively releasable,

a piston and cylinder assembly mounted on said support,

means for conducting pressure fluid to said piston and cylinder assembly to actuate said assembly upon application of a predetermined pressure to said assembly whereby continued subsequent pressure application to the assembly moves the piston and cylinder relative to each other,

means for transmitting the forces developed by the actuation of the piston and cylinder assembly to the tubular members of the liner hanger so that actuation of the piston and cylinder assembly moves said tubular members relative to each other to thereby set the gripping means of the hanger, and

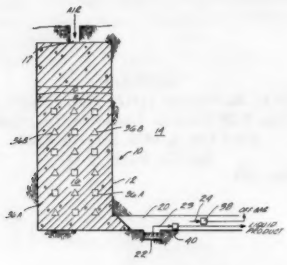
coacting means on the tubular support of the tool and on the liner hanger for preventing premature actuation of the gripping means of said hanger as the tool and hanger are moved within the well bore, said coacting means preventing any relative movement between the tubular members prior to actuation of the piston and cylinder assembly by pressure fluid.

4,249,602

METHOD OF DOPING RETORT WITH A HALOGEN SOURCE TO DETERMINE THE LOCUS OF A PROCESSING ZONE

Robert S. Burton, III, and Carlon C. Chambers, both of Grand Junction, Colo., assignors to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Sep. 15, 1978, Ser. No. 942,680
Int. Cl.[2] E21B *43/24, 47/10*
U.S. Cl. 166—251 **31 Claims**



1. A method for determining the locus of a processing zone advancing through a fragmented permeable mass of formation particles in an in situ oil shale retort in a subterranean formation containing oil shale, the retort having an effluent gas produced therein and withdrawn therefrom, the method comprising the steps of:

placing at a selected location within the boundaries of a retort at least one halogen source for providing halogen material, at least a portion of such halogen material being in the vapor phase at the temperature and pressure of the effluent gas, wherein such halogen source provides halogen material at a predetermined temperature greater than ambient;

advancing a processing zone through the fragmented mass for producing such an effluent gas which is withdrawn from the retort and for providing halogen material from such halogen source at a predetermined temperature; and

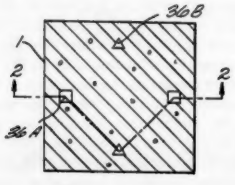
monitoring effluent gas from the retort for presence of such halogen material.

4,249,603

DOPING A RETORT WITH RADIOACTIVE NUCLIDES TO DETERMINE THE LOCUS OF A PROCESSING ZONE

Haven S. Skogen, Grand Junction, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Dec. 26, 1978, Ser. No. 972,869
Int. Cl.[3] E21B *43/247, 43/263*
U.S. Cl. 166—251 **29 Claims**



1. A method for determining the locus of a processing zone advancing through a fragmented permeable mass of formation particles in an in situ oil shale retort in a subterranean formation containing oil shale, the retort having an effluent gas produced therein and withdrawn therefrom, the method comprising the steps of:

placing at a selected location within the boundaries of a retort at least one radionuclide source for providing radionuclide in the vapor phase at the temperature and pressure of the effluent gas, wherein such radionuclide source provides radionuclide at a predetermined temperature greater than ambient;

advancing a processing zone through the fragmented mass to produce such an effluent gas which is withdrawn from the retort and to provide radionuclide from such radionuclide source at a predetermined temperature; and

monitoring effluent gas from the retort for presence of such radionuclide.

4,249,604

RECOVERY METHOD FOR HIGH VISCOSITY PETROLEUM

Terry L. Frazier, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed May 23, 1979, Ser. No. 41,836
Int. Cl.[3] E21B *43/24, 43/30*
U.S. Cl. 166—263 **15 Claims**

1. A method of recovering petroleum from a subterranean petroleum reservoir wherein the petroleum is of such a high viscosity that the petroleum cannot be efficiently produced by conventional primary recovery techniques comprising:

(a) completing a plurality of producing wells in a conventional pattern with normal spacing between the producing wells, wherein the lowest producing interval in a producing well is at or near the basal surface of the reservoir with means provided to raise the producing interval in at least one such well;

(b) completing a plurality of directionally-drilled injection wells extending radially inward toward each producing well, wherein the distance between the producing well and the surface locations of the surrounding injection wells is not less than the normal distance between the producing wells and wherein the distance between the producing well and the bottom hole locations of the injection wells, terminating at the basal surface of the reservoir, is substantially less than the spacing between the producing wells and wherein means are provided to raise the injection interval in at least one such injection well;

(c) injecting a heated aqueous fluid into the reservoir through said injection wells, thereby mobilizing the petroleum and forcing the petroleum towards the producing wells; and

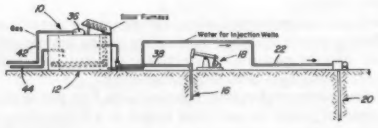
(d) producing the petroleum from the producing wells.

4,249,605

SECONDARY RECOVERY METHOD AND SYSTEM USING SOLAR ENERGY AND CONCENTRIC TANK SEPARATOR

Frank W. Slater, P.O. Box 186, and Dale Fuqua, Box 247, Star Rte., both of Durant, Okla. 74701

Continuation-in-part of Ser. No. 871,966, Jan. 24, 1978, Pat. No. 4,174,752. This application Jul. 27, 1979, Ser. No. 62,236
Int. Cl.[3] E21B *43/24, 43/40;* **F24J** *3/02*
U.S. Cl. 166—266 **9 Claims**



1. A method for secondary recovery of crude oil from an oil bearing formation comprising the steps of depositing a mixture of crude oil, gas and water from a recovery well into a separator tank, heating the mixture in the separator tank to facilitate

separation of gas, crude oil and water, removing the separated gas from the separator tank, removing the separated oil from the separator tank, removing the separated heated water from the separator tank, utilizing the removed heated water to further heat said mixture in the separator tank, and injecting at least a portion of the separated heated water into the oil bearing formation through an injection well to facilitate recovery of crude oil from the formation.

5. A system for secondary recovery of oil from an oil formation including a recovery well and at least one injection well spaced therefrom, a separator tank for receiving production fluid from the recovery well including gas, crude oil and water, heating means associated with the separator tank for heating the production fluid and facilitating the separation of gas, crude oil and water, means for collecting gas at an upper end of the separator tank and discharging it to a desired site, means for removing heated crude oil from the separator tank, means communicated with a lower end of the separator tank for removing and storing the heated water, means for utilizing the stored heated water to further heat the production fluid, and means for injecting at least a portion of the heated water into at least one injection well.

4,249,606

LIGNOSULFONATES CARBOXYLATED WITH CARBON DIOXIDE AS ADDITIVES IN OIL RECOVERY PROCESSES INVOLVING CHEMICAL RECOVERY AGENTS

George Kalfoglou, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 900,691, Apr. 27, 1978, abandoned, Ser. No. 745,505, Nov. 26, 1976, abandoned, Ser. No. 715,957, Aug. 19, 1976, abandoned, Ser. No. 591,573, Jun. 30, 1975, abandoned, and Ser. No. 591,574, Jun. 30, 1975, Pat. No. 4,006,779. This application Nov. 5, 1979, Ser. No. 91,427

Int. Cl.³ E21B *43/22*

U.S. Cl. 166—273 **10 Claims**

1. In a method for recovering oil from a subteranean formation containing oil and having an injection well and a production well wherein an aqueous surfactant solution is injected into the injection well in order to drive the oil to the production well wherein it is produced the improvement which comprises:

injecting into the injection well in admixture with the surfactant lignosulfonates carboxylated with carbon dioxide whereby said carbon dioxide reacts predominantly with the ortho sites of the aryl groups in the lignosulfonates and wherein the lignosulfonate is present in an amount effective for reducing the extent of adsorption of the surfactant by the formation matrix.

4,249,607

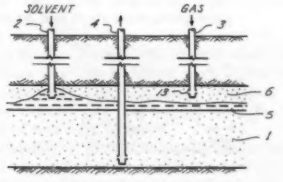
MISCIBLE DISPLACEMENT OIL RECOVERY METHOD

Joseph C. Allen, Bellaire, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed May 17, 1979, Ser. No. 39,726

Int. Cl.³ E21B *43/22, 36/00*

U.S. Cl. 166—274 **16 Claims**



9. In a method of recovering petroleum from a subterranean, petroleum-containing permeable formation, said formation being penetrated by at least one injection well in fluid communication with the upper portion of the formation and by at least one producing well in fluid communication with the lower portion of the formation, comprising injecting a miscible fluid into the formation via the injection well followed by injecting an inert gaseous drive fluid into the formation to displace the miscible fluid and petroleum in a downward direction through the formation to the producing well, from which it is recovered to the surface of the earth, wherein the improvement comprises:

cooling at least one of the fluids injected into the formation in order to reduce the pressure required to achieve a condition of miscibility within the formation.

4,249,608

POLYMER-CONTAINING FLUID AND AN OIL RECOVERY METHOD USING THE FLUID

Walter H. Carter, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

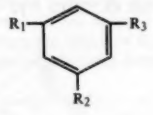
Filed May 9, 1979, Ser. No. 37,587

Int. Cl.³ E21B *43/22*

U.S. Cl. 166—275 **11 Claims**

1. A method of recovering oil from a subterranean, permeable, oil-containing formation penetrated by at least one injection well, and by at least one production well, both wells being in fluid communication with the formation, comprising injecting an aqueous fluid containing a viscosifying amount of a hydrophilic polymer, wherein the improvement comprises:

incorporating in the fluid a bactericidal amount in the range of from 10 to 2000 parts per million of an aromatic treating compound having the following formula:



wherein R_1, R_2 and R_3 are each hydrogen or C_1–C_5 alkyl with the total number of carbon atoms in R_1, R_2 and R_3 being from 0 to 5.

4,249,609

METHOD FOR FORMING CHANNELS OF HIGH FLUID CONDUCTIVITY IN FORMATION PARTS AROUND A BOREHOLE

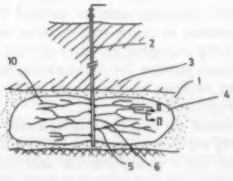
Rudolf Haafkens; Rafael F. Luque, and Willem De Vries, all of Rijswijk, Netherlands, assignors to Shell Internationale Research Maatschappij B.V., Netherlands

Filed Apr. 4, 1979, Ser. No. 27,052

Claims priority, application United Kingdom, Apr. 10, 1978, 13952/78

Int. Cl.³ E21B *43/267, 43/27*

U.S. Cl. 166—280 **11 Claims**



1. A method for forming channels of high fluid conductivity in a relatively soft acid-soluble formation about a cased well which penetrates such formation and which has its casing

perforated along at least a part of the casing wall which faces such formation, comprising the steps of:

(a) producing in the formation a fracture containing a viscous fluid which communicates with the perforations

(b) injecting an acid solution through the perforations into the viscous fluid in the fracture at a pressure at which the fracture remains open, the viscosity ratio between the viscous fluid and the acid solution being chosen such that the viscous fluid is displaced in the fracture in an unstable manner by the acid solution;

(c) continuing the injection of the acid solution through the perforations until channels have been etched in areas of the fracture walls;

(d) injecting a viscous carrying fluid containing a propping agent through the perforations into the fracture at a pressure at which the fracture remains open, the viscosity of the carrying fluid being at least equal to the viscosity of the acid solution;

(e) continuing the injection of the carrying fluid and the propping agent until propping agent is present in the fracture between at least part of those areas of the fracture walls wherein channels have been etched; and

(f) lowering the fluid pressure in the fracture, thereby allowing the fracture walls to be displaced towards a closing position, in which position the walls of the channels are supported and held open by the propping agent.

4,249,610

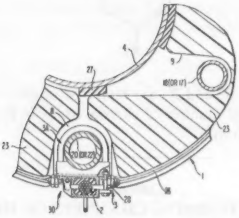
OFFSHORE DRILLING CONTROL CABLE CLAMP SYSTEM

Sven Loland, Stavanger, Norway, assignor to Sante Fe International Corporation, Alhambra, Calif.

Continuation-in-part of Ser. No. 835,874, Sep. 23, 1977, abandoned. This application Apr. 26, 1978, Ser. No. 900,083

Int. Cl.[3] **E21B** *7/12*

U.S. Cl. 166—360 **28 Claims**



25. A cable clamp assembly for releasably clamping a cable to a fixed member of a pipeline riser, said fixed member being recessed from the exterior surface of said riser, said cable clamp assembly comprising:

a fixed cable clamp portion;

a removable cable clamp portion;

means for clamping said fixed cable clamp portion to said recessed riser member such that said fixed cable clamp portion is recessed from the exterior surface of the riser;

a first cable engaging member carried by said fixed cable clamp portion to clamp said cable to said fixed portion,

a second cable engaging member carried by said removable cable clamp portion for cooperating with said first cable engaging member to clamp said cable to said fixed cable clamp portion; and

securing means on said removable cable clamp portion for releasably securing said removable cable clamp portion to said fixed cable clamp portion and for moving said first and second cable engaging members toward each other to secure said cable relative to said fixed cable clamp portion and to move said first and second cable engaging members away from each other to release said cable from said cable clamp.

4,249,611

MARINE CONDUCTOR STRING PROVIDED WITH A CONNECTOR AND A CONNECTOR FOR USE IN SUCH A MARINE CONDUCTOR STRING

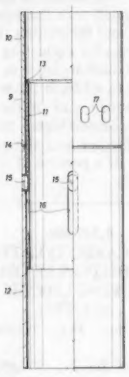
Kornelis N. Zijlstra, Cults, Scotland, assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 7, 1979, Ser. No. 73,356

Claims priority, application United Kingdom, Sep. 15, 1978, 37040/78

Int. Cl.[3] **E21B** *17/01, 17/08, 34/16*

U.S. Cl. 166—367 **10 Claims**



1. A conductor string extending from a marine platform into the bottom of a body of water, wherein the lower part of the conductor string is provided with a connector which comprises a first tubular element, a second tubular element coaxially displaced from and adapted for end-to-end engagement with said first tubular element, a sleeve fixed to the first tubular element and arranged for limited axial displacement relative to said second tubular element in substantially surface-to-surface engagement, cooperating movement-limiting guide means on the sleeve and the second tubular element, a fluid passage in the sleeve which fluid passage is so arranged that by axial displacement of the sleeve relative to the second tubular element a fluid communication between the interior and the exterior of the connector can be created or eliminated.

4,249,612

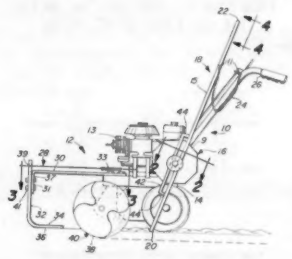
ROTARY TILLER AND ATTACHMENT THEREFOR

Joseph Lajack, 3446 Berkshire, Warren, Mich. 48091

Filed Mar. 9, 1979, Ser. No. 19,278

Int. Cl.[2] **A01B** *33/02;* **B62D** *51/06*

U.S. Cl. 172—43 **5 Claims**



1. In a rotary tiller of the type including an engine driven rotary blade, a frame supporting the engine, and a rearwardly

extending control handle attached to the frame, a travel attachment therefor, the travel attachment comprising:

a fulcrum attached to the frame;

a generally straight control bar longitudinally movable along the fulcrum including a lower end engageable with the ground and an upper end, said control bar being mounted so that said upper end is laterally movable by hand over a substantial distance in a forward and rearward direction by providing about the fulcrum the distance from the upper end to the fulcrum being greater than the distance from the lower end to the fulcrum; and

wherein engaging the control bar lower end against the ground and moving the control bar upper end forward and rearward against the fulcrum forces the fulcrum and tiller in a similar direction in a controlled manner.

4,249,613

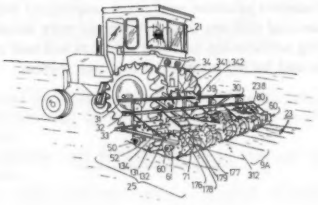
CULTIVATING APPARATUSES AND PROCESS

Charles G. Scribner, Box 933, Dalhart, Tex. 79022

Filed Dec. 28, 1977, Ser. No. 865,310

Int. Cl.³ A01B *39/08*

U.S. Cl. 172—60 **5 Claims**



1. An apparatus comprising a horizontally extending frame and a plurality of reel and shaft assemblies

A. said frame assembly comprising a front rigid frame unit extending in a first direction, said first direction being the direction of the width of said frame, and a plurality of longitudinally extending frame members, each attached to said front frame unit and extending in a second direction transverse to said first direction, said longitudinally extending members being spaced apart from each other along said first direction,

B. said reel and shaft assembly comprising a set of parallel axle shafts and a set of reels supported on each of said shafts,

1. said set of axle shafts comprising

a. a front rigid shaft rotatably attached to said spaced apart longitudinal member of said frame, said front shaft having a longitudinally extending central axis, said axis extending parallel to said first direction, and

b. a rear rigid shaft rotatably attached to said spaced apart longitudinal members of said frame, said rear shaft having a longitudinally extending axis, extending parallel to said first direction, and extending parallel to said axis of said front shaft, said axis of rear shaft being spaced apart from said axis of said front shaft at a distance along said second direction,

2. a plurality of like front reels firmly attached to said front shaft, each of said front reels comprising

a. spaced apart rigid blade supports, each of said blade supports firmly attached to said front shaft and spaced apart along said first direction, each of said blade supports comprising a rigid member extending vertically and also extending in said second direction to the periphery of said rigid member,

b. and a plurality of ground engaging blades, each of said ground engaging blades firmly attached to said blade supports near the periphery thereof and each said blade having a straight peripheral edge, said peripheral edge of each of said blades on each of said front reels located at the same distance measured transversely to said front shaft, each of said blade edges extending parallel to and at equal distance from each other and extending circumferentially of said front shaft, said ground engaging blades extending in said first direction between and attached to two of said spaced apart blade supports attached to said front shaft,

3. A plurality of like rear reels firmly attached to said rear shaft, each of said rear reels comprising

a. three spaced apart rigid blade supports, each of said supports firmly attached to said rear shaft and spaced apart along said firt direction, each of said three blade supports comprising a rigid member extending vertically and also extending in said second direction to a periphery of said rigid member,

b. and a plurality of ground engaging blades, each of said ground engaging blades firmly attached to said blade supports near the periphery thereof and each said blade having a peripheral edge, said peripheral edge of each of said blades on each of said rear reels located at the same distance measured transversely to said rear shaft, portions of each of said blade edges extending parallel to and at equal distance from each other and extending circumferentially of said shaft, all portions of said peripheral edge of said ground engaging blades on said second reel extending at an angle to the axis of the rear shaft and extending in said first direction for the same length as the ground engaging blades on said first reels,

4. means connecting to said front shaft and said rear shaft to drive said rear shaft in the same angular direction as said front shaft and the peripheral edge of the blades on said rear set of reels in the same angular direction as and at a greater linear speed than the peripheral edge of said blades on said front set of reels, and wherein the peripheral edges of the ground engaging blades on the front set of reels are located in flat planes parallel to said central longitudinal axis of said front shaft, and wherein the peripheral edges of the ground engaging blades on the rear set of reels are located in flat planes which are intersected by the axis of said rear shaft.

4,249,614

IMPLEMENT

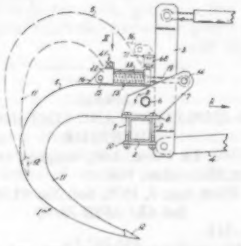
Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed May 2, 1978, Ser. No. 902,034

Claims priority, application Netherlands, May 4, 1977, 7704892

Int. Cl.³ A01B *13/08, 61/04*

U.S. Cl. 172—261 **13 Claims**



1. An implement comprising a frame and tool means rigidly interconnected in operative position with the frame by overload locking means during normal operation, said tool means being pivotably mounted on a beam of said frame and displaceable relative to said beam responsive to overload on said tool means, said locking means comprising an enclosed hydraulic circuit that includes a cylinder with a slideable piston, said piston including a rod that extends through one end of the cylinder to a pivot connection to said frame, spring means

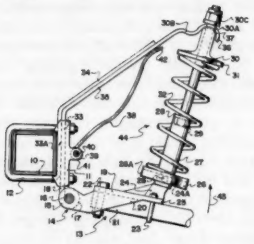
urging said piston to adjacent said one end and the tool means to operative position, the other end of said cylinder being connected to said tool means, said circuit including bore means in communication with the cylinder to one side of said piston, a by-pass conduit leading from said bore means to reservoir means in communication with said cylinder via further bore means to the other side of said piston and near said one end, a displaceable pressure relief valve in said circuit that releases fluid automatically responsive to overload above a predetermined limit pressure and allows said piston to slide within the cylinder with accompanying substantial displacement of the tool means out of operative position.

4,249,615

TWO-STAGE TRIP RELEASE SHANK ASSEMBLY

Terrance Friggstad, Frontier, Canada, assignor to Friggstad Manufacturing Ltd., Frontier, Canada

Filed Apr. 30, 1979, Ser. No. 34,335
Int. Cl.[2] A01B *61/04*
U.S. Cl. 172—266 **6 Claims**



1. A trip release shank assembly for implements, said trip release shank assembly comprising in combination a frame, a shank assembly pivotally secured by one end thereof to said frame, spring means connected by one end thereof to said shank assembly, means extending from said frame supporting the other end of said spring means, said spring means normally urging said shank assembly downwardly, the connection of said spring means to said shank assembly passing over center when said shank assembly fully trips and means to return said connection between said spring means and said shank assembly back over center when the obstruction causing said shank assembly to trip has been passed, said means to return said connection between said spring means and said shank assembly back over center including a leaf spring secured by one end thereof to said frame and operatively engaging, by the other end thereof, said extending means adjacent said connection between said spring means and said shank assembly when said shank assembly trips.

4,249,616

FOLDING IMPLEMENT AND FOLDING SUPPORT THEREFOR

Richard G. Moe, La Porte, Ind., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

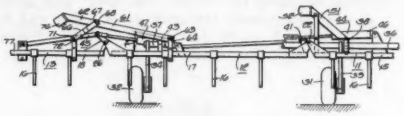
Filed Aug. 3, 1979, Ser. No. 63,363
Int. Cl.[2] A01B *73/00*
U.S. Cl. 172—311 **3 Claims**

1. A foldable implement having first and second sections pivotally interconnected on a longitudinal folding axis and an actuator for causing the first section to fold from a working position in which said sections are in general alignment to a folded transport position characterized by

a folding support independent of said actuator including

a main support arm pivotally connected at one of its ends to one of said sections on a first longitudinal pivot axis parallel to and spaced laterally from said folding axis and

a link having a fixed point at one of its ends pivotally connected to an intermediate point of said support arm on a second longitudinal axis and its other end pivotally connected to the other of said sections on a third longitudinal axis parallel to and spaced laterally from said folding axis, said folding support having a relatively low silhouette in the working position of said sections, said link causing said arm to swing from a predetermined angle relationship with said one section to a



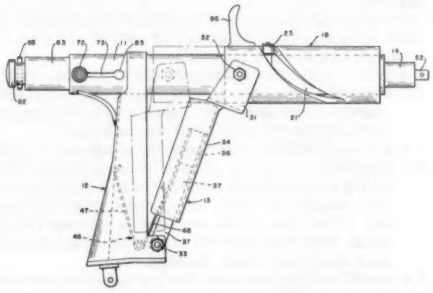
support position of increased angle relationship with said one section wherein the other end of said arm is in abutting relationship with said other section when the latter is pivoted from its working position to its folded transport position, said pivot connection between said arm and said one section being the only thrust transmitting relationship between said arm and said one section in said folded position of said one section.

4,249,617

PORTABLE ONE-HAND OPERATED ROTARY TORQUE PRODUCING TOOL

James D. Cox, Jr., 7420 Birkdale Dr., Newark, Calif. 94560

Filed Oct. 22, 1979, Ser. No. 86,732
Int. Cl.[3] B23B *45/00*; B27C *3/08*
U.S. Cl. 173—170 **10 Claims**



1. A rotary torque producing tool comprising:

a housing having a pistol grip handle with a manually grippable and displaceable part;

a tool operating shaft mounted for rotation in said housing;

clutch members carried by said housing for rotation in surrounding relation to said shaft;

drive means connecting said members and part and providing rotation of said members in opposite directions about said shaft upon gripping displacement of said part; and

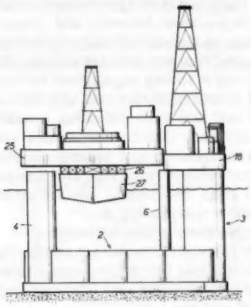
means selectively engaging said members and shaft for obtaining optional direction of rotation of said shaft.

4,249,618

METHOD AND APPARATUS FOR THE WORKING OF UNDERWATER DEPOSITS

Jacques E. Lamy, Fontenay-Aux-Roses, France, assignor to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines, Paris, France

Filed Dec. 18, 1978, Ser. No. 970,108
Claims priority, application France, Dec. 19, 1977, 77 38342
Int. Cl.³ E21B *7/136*
U.S. Cl. 175—9 **5 Claims**



1. Apparatus for working an underwater deposit comprising:
a platform structure for location resting on the bed of an area of water;
drilling devices and installations fitted on said platform structure;
supports on the platform structure capable of receiving a production bridge;
a production bridge;
production devices and installations fitted on the production bridge;
means for transporting the production bridge to the platform structure and of placing it on the said supports;
wherein the platform structure comprises a base enclosing a chamber suitably divided into water-tight compartments forming ballastable floats, a hollow shaft rising vertically at one end of the base, a drilling bridge supported by the hollow shaft, devices and installations, supported by the drilling bridge, enabling drilling to be carried out through the hollow shaft, and a plurality of columns rising vertically and designed to carry the production bridge next to the drilling bridge; and
wherein the columns are separated into two groups with sufficient room between them to allow a float to pass supporting the production bridge in order to place this on said columns.

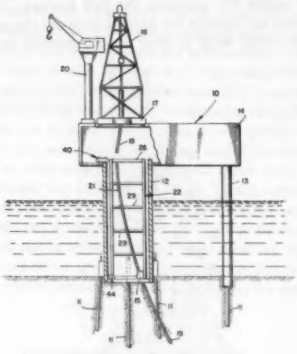
4,249,619

DEVIATED DRILLING APPARATUS

Robert B. Burns, Huntington, N.Y., assignor to Texaco Development Corporation, White Plains, N.Y.

Filed Jun. 4, 1979, Ser. No. 45,496
Int. Cl.³ E21B *15/02, 7/04*
U.S. Cl. 175—9 **8 Claims**

1. A marine structure for drilling deviated wells into the ocean floor at an offshore body of water, said structure including; a deck which is positioned above the water's surface to hold well drilling equipment including a rotatable drill string,
at least one upstanding leg supportably connected to said deck and extending downwardly to said ocean floor,
a conductor cage extending downwardly from said deck and through said upstanding leg when said cage is in the drilling position, and at least one conductor guide in said cage aligned to receive a descending drill string,
said conductor cage being upwardly movable through said leg whereby to raise the cage lower end to a position adjacent to the leg upper end, and



hinge means on said leg adapted to provisionally engage said cage lower end whereby to permit the cage to be pivotally rotated about said hinge to a substantially horizontal plane.

4,249,620

METHOD OF BORING HOLES WHICH ARE OPEN AT BOTH ENDS IN THE GROUND

Paul Schmidt, Winterberger Strasse, 5940 Lennestadt-Saalhausen, Fed. Rep. of Germany

Filed May 9, 1979, Ser. No. 37,338
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1978, 2824915
Int. Cl.³ E21B *7/26, 7/28*
U.S. Cl. 175—53 **5 Claims**

1. A method of boring holes, which are open at both ends, in the ground by means of a self-propelled displacement hammer, said method comprising the steps of first forming an accurately aligned pilot bore of relatively small diameter in advance of said displacement hammer, inserting a cable through said pilot bore, connecting one end of said cable to said displacement hammer and then causing said hammer to move through said pilot bore, said displacement hammer being of a greater diameter than said pilot bore whereby said pilot bore is increased in diameter, guiding said displacement hammer through said pilot bore by pulling displacement hammer through said bore by pulling on said cable and attaching a follow-up extension pipe to said displacement hammer of smaller diameter before said displacement hammer of smaller diameter forms said pilot bore.

4,249,621

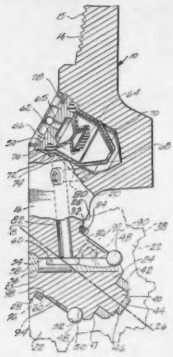
FRICTION BEARING ROCK BIT AND SEGMENT

Salvador Espana, Costa Mesa, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Division of Ser. No. 893,196, Apr. 3, 1978. This application Mar. 22, 1979, Ser. No. 22,709
Int. Cl.² E21B *9/08*
U.S. Cl. 175—227 **9 Claims**

1. An improved rock bit of the friction bearing type and formed of multiple segments, each segment having a journal mounting a rotary cutter, a pressure compensated lubrication

system to lubricate the interface between the cutter and the journal, radially aligned ball bearing races of the cutter and the journal, ball bearings in the races to secure the cutter on the journal, means for inserting the ball bearings into the races, radial wear surfaces on the journal between the journal and the cutter, an axial wear surface on the journal for thrust loads



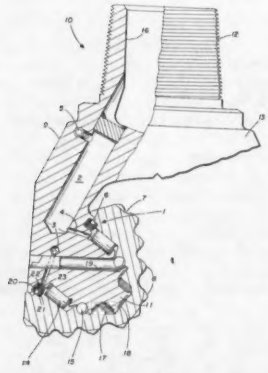
from the cutter, a seal at the foot of the journal to seal the interface between the cutter and the journal from the environment, a wear surface on a leg of the segment adjacent the foot of the journal for the seal, the segments being welded together, the improvement which comprises a carbon enriched thin case entirely over each segment, the case having a hardness greater than the parent material of the segment.

4,249,622

FLOATING SEAL FOR DRILL BITS

Theodore R. Dysart, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 920,868, Jun. 30, 1978, abandoned.
This application Jun. 11, 1979, Ser. No. 47,416
Int. Cl.[3] E21B *10/24*
U.S. Cl. 175—227 **2 Claims**



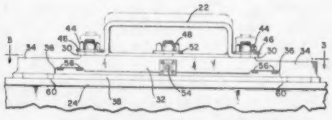
1. A rolling cone cutter earth boring bit, comprising:
an annular bit body having an upper externally threaded portion and a central passage in said bit body;
at least one arm extending downwardly from said bit body and terminating in an inwardly downwardly projecting cylindrical bearing pin;
an annular groove in said arm at the root portion of said bearing pin;
a cone cutter rotatably mounted on said cylindrical bearing pin and having an open ended cavity providing a cone mouth adjacent said root portion with said rolling cone cutter substantially surrounding said bearing pin;
an annular shoulder within said cone mouth adjacent to and concentric with said annular groove bearing;
cutter retaining means interposed between said bearing pin and said rolling cone cutter;
a seal assembly disposed in said aligned groove and shoulder between said bearing pin and said rolling cone cutter, said seal assembly including a first seal unit comprising a first annular rigid ring in said groove and a first resilient ring in sealing engagement between said groove and said first rigid ring, and a second seal unit comprising a second annular rigid ring positioned in said shoulder and a second resilient ring in sealing engagement between said shoulder and said second rigid ring, and, said first and second rigid rings of said seal units providing a relatively moveable sealing interface therebetween when said rolling cone cutter is mounted on said bearing pin whereby said first and second resilient rings urge said first and second annular rigid rings into sliding contact as said cone cutter rotates about said bearing pin;
a lubricant reservoir in said bit body;
a first upper lubricant flow passage connecting said lubricant reservoir and said bearing and cutter retaining means;
a relief valve connecting said lubricant reservoir with the outside of said bit;
a second lubricant flow passage extending from outside said arm to immediately adjacent said sealing interface on the lubricant side thereof and generally opposite said upper passage for introducing new lubricant into said bit; and
a plug for closing said second passage whereby new oil introduced from said second passage must flow adjacent the sealing interface and across the bearings to flush the previous oil therefrom for expulsion through said relief valve.

4,249,623

LOAD CELL FOR ON-BOARD WEIGHING SYSTEMS

Jerry L. McCauley, Renton, Wash., assignor to Structural Instrumentation, Inc., Tukwila, Wash.

Filed Oct. 24, 1979, Ser. No. 87,756
Int. Cl.[3] G01G *19/12*
U.S. Cl. 177—136 **5 Claims**



1. A load cell adapted to be positioned between the frame of a locking vehicle and a bunk-supporting cross-bar having a pair of transversely spaced bolt holes, said load cell comprising:
an elongated, planar beam support plate adapted to be mounted on said frame beneath said bunk;
an elongated, rectangular measurement beam having a central portion connected to a pair of end portions by respective, relatively thin intervening portions, said end portion being secured to the upper surface of said beam support plate and having a thickness which is greater than the thickness of said intervening portions, said end portions projecting below said central and intervening portions such that said central and intervening portions can deflect toward said beam support plate when a load is applied to said central portion, said central portion having formed therein a pair of threaded, bolt-receiving bores spaced apart from each other by a distance equal to the spacing between said cross-beam bolt holes, said central portion laying entirely within the confines of said intervening

portions without overlaying either intervening portion; and

strain gauge means secured to the lower surface of each intervening portion for measuring the load-induced downward deflection of said central portion.

4,249,624

BENDING FORCE RECEIVER

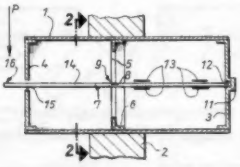
Ernst Kuhnle, Balingen, Fed. Rep. of Germany, assignor to Bizerba-Werke Wilhelm Kraut KG, Balingen, Fed. Rep. of Germany

Filed Aug. 13, 1979, Ser. No. 65,844

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1978, 2836011

Int. Cl.³ G01G *3/14, 21/28*

U.S. Cl. 177—211 **9 Claims**



1. A bending force receiver comprising a bending rod which is supported in a main bearing and is provided with a force introduction location, restraining means limiting axial movement of the rod in response to an applied force, strain gauges mounted on the bending rod in a region between the main bearing and said restraining means, and a sealing casing which freely surrounds the said region of the bending rod, the bending rod extending in the form of an elastically bendable cantilever arm including the force introduction location, projecting from the casing at the main bearing in a sealed manner and co-operating at the free end of the cantilever arm with an overload abutment.

4,249,625

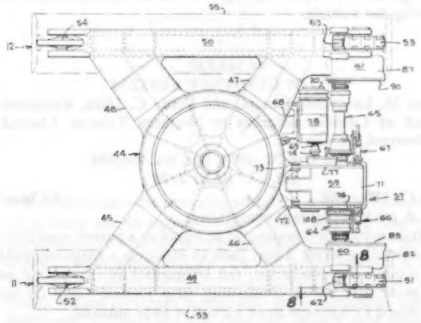
DRIVE SYSTEM FOR CRAWLER PROPELLED MACHINES

Michael M. Palm, Marion, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 19, 1979, Ser. No. 21,802

Int. Cl.³ B62D *11/08, 55/12*

U.S. Cl. 180—6.7 **16 Claims**



1. In a machine having a frame, a pair of crawler treads mounted on said frame and drive sprockets journaled in said frame and drivingly engaged with said crawler treads, a crawler drive system comprising drive means mounted on said frame, a first clutch movable between a drive position for transmitting drive from said drive means to a first of said drive sprockets and a lock position for locking said first drive sprocket to said frame, a second clutch movable between a non-drive position for permitting a second of said drive sprockets to free wheel, a drive position for transmitting drive from said drive means to said second drive sprocket and a lock position for locking said second drive sprocket to said frame, a first means for locking said first drive sprocket to said frame, a second means for locking said second drive sprocket to said frame, means for selectively engaging said first and second locking means with said first and second drive sprockets, respectively, means for shifting said first clutch between the drive and lock positions thereof, means for shifting said second clutch between the non-drive, drive and lock positions thereof, and means releasable responsive to engagement on one of said first and second drive sprocket locking means for preventing said second clutch from shifting to said non-drive position.

4,249,626

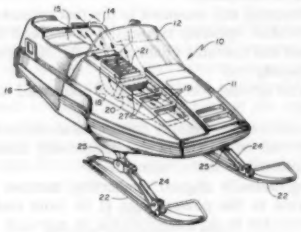
LIQUID COOLING SYSTEM

Samuel Fields, and Wesley J. Anderson, both of Minneapolis, Minn., assignors to Kawasaki Motors Corp. U.S.A., Santa Ana, Calif.

Filed Sep. 14, 1977, Ser. No. 833,173

Int. Cl.³ B62D *27/00*

U.S. Cl. 180—54 A **2 Claims**



1. A liquid cooling system for a snowmobile having a front hood and a windshield extending generally upwardly and rearwardly from a portion thereof comprising:

a heat exchange element having a front surface area and a rear surface area and air flow passage therebetween and positioned so that said front surface area generally faces the forward end of said snowmobile said heat exchange element being tipped from the vertical at an angle of at least 5° but less than 45° so that the lower edge of said heat exchange element is disposed rearwardly of the upper edge;

means for providing air flow to said front surface of said heat exchange element along a path substantially parallel to the forward movement of the snowmobile, said means including a first air guide surface extending generally parallel to the forward movement of the snowmobile and generally between the lower edge of said heat exchange element and a forward surface of the snowmobile and a plurality of vertically spaced second air guide surfaces disposed forward of said front surface and extending generally parallel to the forward movement of the snowmobile; and

a generally horizontally disposed vent wherein said vent is disposed within a portion of said hood and to the rear of said windshield;

means for directing air flow from said rear surface area of said heat exchanger in a generally upward direction including a baffle element extending from the lower edge of said heat exchange element and curving upwardly and a duct extending from the perimeter of said rear surface area and curving upwardly to said vent.

4,249,627

CHASSIS AND SUSPENSION ARRANGEMENT FOR MOTOR VEHICLES

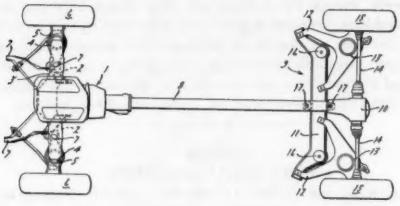
Walter Voll, Odenthal, and Anton Matheis, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 26, 1979, Ser. No. 79,002

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1978, 2843917

Int. Cl.³ B60K *17/16*

U.S. Cl. 180—73 D **8 Claims**



1. A chassis and suspension arrangement for a motor vehicle comprising;

a powerplant mounted on the front portion of said morot vehicle

a rear crossmember;

a differential unit mounted to the rear crossmember;

a driveshaft operably connected at one end to the powerplant and operably connected to the differential unit at an opposing end;

two rear driving wheels operably connected to the differential;

suspension arms operably connected at one end to a respective rear wheel and at an opposite end thereof pivotably connected to said crossmember;

a longitudinally aligned connecting member rigidly connected to the power plant at its front end and rigidly connected to the differential at its rear end;

said connecting member being torsionally and flexuraly rigid;

two elastomeric elements longitudinally aligned and spaced apart pivotably mounting the connecting member and differential unit to the rear crossmember on a longitudinal axis of said motor vehicle.

4,249,628

SYSTEM OF CONTROL FOR SURFACE EFFECT VEHICLE

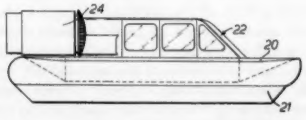
Timothy J. R. Longley, Gosport, England, assignor to Ingles Hovercraft Associates Limited, Kent, England

Filed Dec. 8, 1978, Ser. No. 967,730

Claims priority, application United Kingdom, Dec. 9, 1977, 51387/77

Int. Cl.³ B60V *1/11*

U.S. Cl. 180—117 **15 Claims**



1. A surface effect vehicle having means for forming and maintaining a cushion of air beneath the structure of the craft to support it above a land or water surface;

means comprising two motor driven ducted fan units each having an aileron flap mounted for pivoting movement about a normally horizontal axis in the duct of the fan unit downstream of the fan, for propelling the craft in a forward direction when so supported;

wherein said aileron flaps are differentially operable to selectively exert a tilting movement in the craft about its longitudinal axis during such forward motion and in which each aileron flap is movable at least between a normal position in which its plane is parallel to the axis of the duct and a fully operated position in which it extends across and substantially closes the respective fan duct.

4,249,629

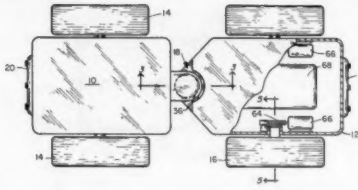
ARTICULATED VEHICLE

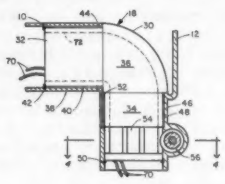
Arthur R. Hutt, 707 Pluma Dr., Bellevue, Nebr. 68005

Filed Feb. 2, 1979, Ser. No. 8,668

Int. Cl.³ B62D *5/06*

U.S. Cl. 180—134 **14 Claims**





1. An articulated vehicle including front and rear wheeled sections; coupling means intermediate the sections and connecting them together for relative movement about both fore-and-aft and vertical axes, characterized in that the coupling means is an integral hollow L-shaped member, to provide unobstructed communication between the sections, with its hollow horizontal leg journalled to one section on the fore-and-aft axis and its hollow vertical leg journalled to the other section on the vertical axis; force receiving means on the vertical leg; and force applying means in the associated section for steering the vehicle.

4,249,630

PLOW GUIDANCE SYSTEM

James H. Lougheed, Kanata, and Lorne C. Hinz, Richmond, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Oct. 31, 1978, Ser. No. 956,099

Int. Cl.³ B62D *1/28*

U.S. Cl. 180—168 **8 Claims**

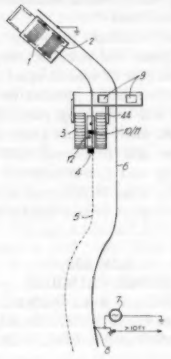
1. A guidance system comprising:

a transmitter for coupling an ac signal to a buried conductor extending along a first path to establish a magnetic field around the conductor, the transmitter incorporating an essentially spiral conducting strip formed on a circuit board to function as an inductive field antenna;

vehicle mounted plow means for plowing along a second path; for laying a cable and

a vehicle mounted receiver for receiving a signal emitted by the conductor, the receiver including signal analyzing means adapted to analyze the emitted signal and to determine therefrom a lateral direction and extent of movement

required of the vehicle in order to maintain a predetermined lateral spacing of the paths and display means under



the control of said signal analyzing means to display said lateral direction and extent of movement.

4,249,631

AXLE FOR MOTOR VEHICLES

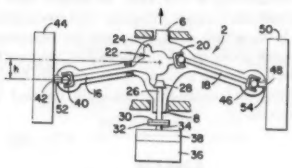
Walter Hüneke, Mannheim, Fed. Rep. of Germany, assignor to Deere & Company, Moline, Ill.

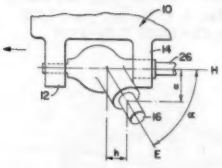
Filed May 14, 1979, Ser. No. 39,036

Claims priority, application Fed. Rep. of Germany, May 13, 1978, 2821178

Int. Cl.³ B60K *17/32, 23/04*

U.S. Cl. 180—255 **17 Claims**





1. A drive axle for steerable wheels of a motor vehicle having a frame and an engine-driven transmission and adapted for movement in a forward direction, comprising: an axle housing, a pair of drive shafts rotatably carried in the housing, a differential supported in the housing and drivingly connected to the shafts, means drivingly connecting the transmission with the differential wherein the two shafts are angled with respect to each other such that in a generally horizontal plane they form a rearwardly open angle and in a generally upright plane they form a downwardly open angle, and means rockably connecting the axle housing to the frame for pivoting about a fore-and-aft extending axis.

4,249,632

SAFETY DEVICE FOR THE PROTECTION OF PEDESTRIANS

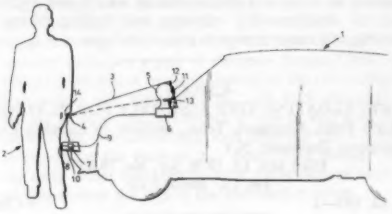
Erich Lucchini, Wolfsburg, and Martin Kramer, Gaimersheim, both of Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Mar. 30, 1979, Ser. No. 25,751

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1978, 2814107

Int. Cl.³ B60R *21/14*

U.S. Cl. 180—274 **10 Claims**



1. A safety device for the protection of pedestrians involved in a collision with a vehicle having a front hood extending in a generally horizontal plane above the vehicle frame and covering a forward compartment in a front part of the vehicle comprising:

displacement means for the displacement of the front hood from a rest position into an impact position raised relative to the rest position, said displacement means being arranged in the zone of the front hood of the vehicle; and

sensor means arranged in the front zone of the vehicle for detection of a collision with the pedestrian, said displacement means being triggered into operation by said sensor means upon detection of a collision with the pedestrian.

4,249,633

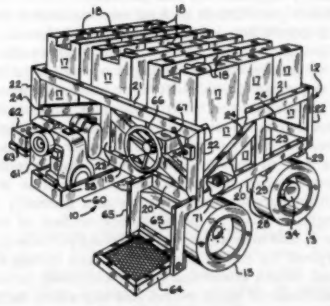
SCALE TESTING CART

Glenn G. Dunbar, 2608 Overbrook Dr., Toledo, Ohio 43614

Continuation-in-part of Ser. No. 833,066, Sep. 14, 1977, abandoned, and a continuation-in-part of Ser. No. 931,995, Aug. 8, 1978, Pat. No. 4,211,297. This application Mar. 1, 1979, Ser. No. 16,430

Int. Cl.³ B60K *9/00, 17/10;* G01G *23/00;* B60P *3/00*

U.S. Cl. 180—306 **7 Claims**



1. A scale testing cart for positioning scale calibration weights on a platform scale comprising a weight receiving bed having a generally rectangular periphery, a top, a bottom, two sides and two ends, a truss means attached to said weight bed top, said truss means having rails and extending above and completely about said periphery, said truss means defining

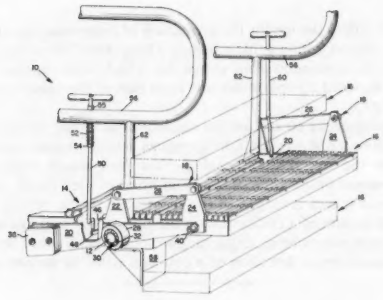
reinforcement for said weight bed, an axle carrier assembly having two ends, means attaching said carrier assembly to said weight bed bottom adjacent one end of said weight bed to pivot about a horizontal central axis of said cart, a first pair of wheels, steering knuckle means attaching said wheels of said first pair to opposite ends of said carrier assembly, hydraulic steering means for simultaneously pivoting said knuckle means to steer said cart, a second pair of wheels, means rotatably attaching said second wheels to said weight bed bottom adjacent the other end and adjacent said two sides of said weight bed, normally engaged hydraulic braking means connected to said second pair of wheels, hydraulic motor means operatively connected to drive said second pair of wheels and hydraulic means for simultaneously releasing said braking means and powering said motor means to propel said cart.

4,249,634

SAFETY FLOATING STEP ASSEMBLY FOR PLATFORM

P. Keith Potts, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 12, 1979, Ser. No. 75,057
Int. Cl.³ B60R *3/02*
U.S. Cl. 182—1 **5 Claims**



1. A safety floating step assembly for connection to a platform that extends generally horizontally and provides access to the top of different height vehicles or other carriers that may be located alongside the platform, said floating step assembly being self-leveling and adjustably movable to the same and different horizontal levels of position relative to said platform and comprising:

shaft means extending generally horizontally relative to and rotatably supported by said platform;

step means provided in at least one horizontal plane and being spaced from said platform above, below or adjacent the location of said tops of different height vehicles;

a pair of parallel four-bar linkages operatively connecting said step means to said shaft means extending between said step means and said shaft means and enabling said step means to remain level at any said adjusted horizontal level of position, said pair of parallel four-bar linkages having:

(a) a pair of parallel, spaced-apart main support arms connected to said shaft means for rotation therewith within parallel planes that project generally at right angles relative to the horizontal surface of said platform, said main support arms having portions extending beyond the end of said platform and having a second shaft means connected to and extending between the outer ends of said portions, said step means being pivotally connected to said second shaft means for suspended pivotal movement from said outer ends of said main support arms;

(b) a first pair of spaced-apart support members fixed to said platform and projecting at right angles from and above the surface of the platform a predetermined distance, and a second pair of spaced-apart support members fixed to either side of said step means and projecting at right angles from and above the step means to the same relative predetermined distance as said first pair of support members; and

(c) a pair of link members pivotally connected to and between the upper end portions, respectively, of said first and second pair of spaced-apart support members, each link member being parallel to one of the main support arms and remaining parallel in any position assumed by said main support arms; and

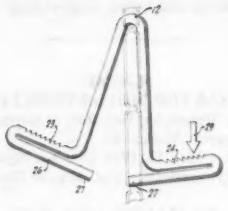
means mounted on said first-mentioned shaft means for releasably locking said first-mentioned shaft means and said main support arms at different rotated positions of adjustment with respect to said platform.

4,249,635

FENCE CLIMBER

Wilfred H. West, 6520 Lucas Ave., Oakland, Calif. 94611

Filed Jun. 13, 1979, Ser. No. 48,018
Int. Cl.³ A63B *29/04;* **E06C** *9/04, 7/08*
U.S. Cl. 182—92 **4 Claims**



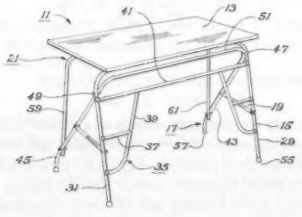
1. A fence climber for use with a fence that has a wire mesh construction comprising a rod near its center bent into an approximately half-circular arc merging with two substantially equal legs each of which continues into an out-turned step portion of an extent to receive a climber's foot, and each of said step portions being doubled back upon itself to form an inwardly projecting end extending inwardly beyond said leg associated therewith.

4,249,636

WORK TABLE OR PORTABLE SCAFFOLD

Charles A. Jackson, Rte. 2, Box 442, Hillsboro, Tex. 76645, and Ray A. Ecklund, 2532 Oakwood Ter., Fort Worth, Tex. 76117

Filed Mar. 6, 1979, Ser. No. 17,928
Int. Cl.³ E04G *1/34, 1/28*
U.S. Cl. 182—152 **5 Claims**



1. A portable, collapsible scaffold comprising:

a. a substantially planar top platform;

b. a front U-shaped leg structure including at least a pair of operationally downwardly extending legs rigidly connected with a front cross member; said front cross member being pivotally connected with said top platform adjacent

a longitudinal edge thereof such that said front legs are adapted to fold laterally into a collapsed position substantially parallel with said platform and fold into a supporting position substantially perpendicular to said platform;

c. a diagonally extending leg structure including a pair of operationally diagonally extending legs that are pivotally connected with said front legs near their top close to and below said platform and adapted to fold laterally into a collapsed position substantially parallel with said platform and said front legs and to fold into a supporting position extending diagonally downwardly and rearwardly to form the rear lower legs;

d. collapsible braces connected near the midpoint of said front legs and said diagonal legs; said collapsible braces being adapted to form a triangle brace at their most elongate dimensions in said supporting position and to fold laterally into a collapsed position substantially parallel with and alongside said front and diagonal legs;

e. an upper rear U-shaped leg structure including a pair of operationally downwardly extending rear legs rigidly connected with a rear cross member; said rear cross member being movable along the bottom of said top platform and said rear legs being pivotally connected with said diagonal legs below the midpoint thereof and above the bottom thereof such that said rear leg structure is adapted to fold laterally into a collapsed position substantially parallel with said platform and said front and diagonal legs to form a compact, readily portable scaffold and to move into a supporting position substantially perpendicular to said platform;

f. elongate bracket containing said rear cross member in close proximity to said top platform in both said collapsed and supporting positions; and

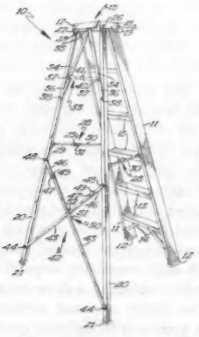
g. locking means for locking said rear cross member into said supporting position and adapted to prevent collapse of said scaffold until said platform is liftable to release said locking means.

4,249,637

TRIPOD STEPLADDER

David A. Glasgow, 14723 Easter Ave., Apple Valley, Minn. 55124

Filed Sep. 28, 1979, Ser. No. 80,073
Int. Cl.³ E06C *1/20*
U.S. Cl. 182—170 **5 Claims**



1. A tripod stepladder comprising:

a pair of laterally spaced apart, elongate, substantially straight stiles,

a plurality of vertically spaced apart, substantially parallel steps extending between and rigidly connected with the stiles,

a platform rigidly secured to the top of said stiles,

a hinge member hingedly connected to said platform pivoting movement about an axis disposed substantially parallel to the steps,

a pair of elongate, substantially straight legs each being pivotally connected to said hinge member for pivotal movement relative thereto about an axis disposed substantially normal to the pivotal axis between the hinge member and said platform to permit swinging movement of said legs as a unit about said first pivotal axis towards and away from said stiles, and permitting swinging movement of said legs about said second axes between extended and non-extended positions,

means interconnecting each leg in one of said stiles permitting pivoting movement of said legs away from said stiles about said first pivotal action,

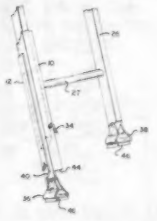
a foldable linkage interconnecting said legs and said hinge member including a pair of elongate diagonal links each being connected at one end thereof to the other diagonal link and to said hinge member, and each diagonal link having its other end connected to one of said legs, transverse links interconnecting said diagonal links together intermediate the ends of the latter, said linkage being operable when unfolded to limit movement of said legs and stabilizing the legs in the extended position.

4,249,638

LADDER EXTENSION APPARATUS

Albert Fernandez, 2208 W. Virginia Ave., Clarksburg, W. Va. 26301

Filed Dec. 26, 1979, Ser. No. 107,264
Int. Cl.³ E06C *7/44*
U.S. Cl. 182—201 **4 Claims**



1. A ladder rail extension device comprising:

a. at least three bolts;

b. a pair of L-shaped side members disposed so that one side of one L-shaped side member overlaps one side of the other L-shaped member thereby forming a U-channel, one L-shaped member has at least three threaded holes sized to receive the bolts and the other L-shaped member has an equal number of larger holes, sized so as to permit a bolt to hang loosely from the side member when not engaged in a threaded hole;

c. a keeper attached to each bolt to prevent the bolt from slipping out of the oversized hole; and

d. a retaining means for holding the overlapping sides in desired position.

4,249,639

POWER GENERATING APPARATUS

Marko Vukovic, 38 Leggatt St., Melton, Victoria, Australia

Filed Feb. 21, 1979, Ser. No. 13,389
Claims priority, application Australia, Feb. 28, 1978, PD3543
Int. Cl.³ F03G *7/08*
U.S. Cl. 185—30 **4 Claims**

1. Apparatus for generating electrical power utilizing the motion of waves on an open body of water comprising:

(a) an elongate support structure means extending vertically upwards from a base relatively fixed with respect to said body of water,

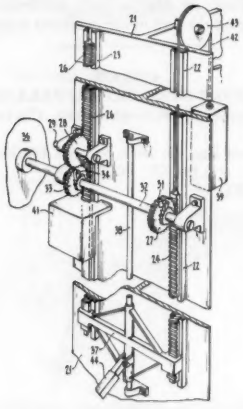
(b) guide means on said support structure means for at least two vertically moveable gear racks and a vertically moveable cross-arm engaged with each rack,

(c) motion transmitting means on the cross-arm to move a first one of said gear racks during upward movement of the cross-arm and to move a second of said gear racks during downward movement of the cross-arm,

(d) at least one gear wheel engaged with each gear rack, each gear wheel drivingly connected to an output shaft through one-way motion transmitting means whereby the motion of each gear rack in one direction only drivingly rotates said output shaft,

(e) a first driving mass fixed to said first one of said gear racks to drive the gear rack downward under the action of gravity,

(f) a second driving mass secured by cable means passing around pulley means on the support structure means to said second of said gear racks to drive the said second gear rack upwardly under the action of gravitational forces on said second mass,



(g) float means on said body of water and horizontally spaced from the support structure means, said float means having a shape and configuration whereby the wave motion causes the float means to move vertically relative to said base,

(h) support means for said float means pivotally mounted to a pivot support means fixed relative to said base and between said float and said support structure means,

(i) beam means pivotally mounted at one end to said pivot support means and extending towards said support structure means, said beam means being adjustably secured to said support means for movement therewith in the vertical plane, and

(j) a connecting arm pivoted at one end to the free end of said beam means and extending generally, upwardly therefrom to said cross-arm, whereby vertical movement of said float means reciprocatingly drives said cross-arm vertically on its associated guide means.

4,249,640

CORNER POST PLATFORM ASSEMBLY

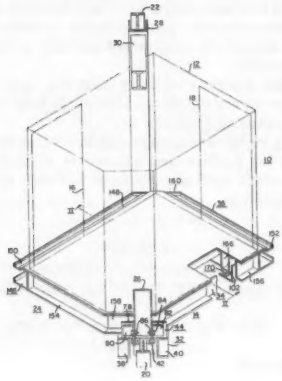
Richard H. Darwent, Hopatcong; George R. Phillips, Hanover, and Herman S. Karol, Morris Township, Morris County, all of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 2, 1979, Ser. No. 35,169
Int. Cl.³ B66B 9/00
U.S. Cl. 187—1 R **9 Claims**

1. A corner post platform for supporting an elevator cab having door openings in two adjacent wall portions, comprising:

a safety assembly having first and second ends, and a longitudinal axis which extends between its ends, said safety assembly including first and second spaced channel members, which extend between the first and second ends, and first and second plate members adjacent to the first and second ends, respectively, which define first and second flat surfaces disposed in a common horizontal plane, said first and second plate members each including first and second portions which extend outwardly beyond the first and second spaced channel members, respectively,

a support frame including first, second, third and fourth angle members, said first and second angle members each having first and second ends, said first and second angle members being disposed in spaced, parallel relation, with the third angle member extending between the first ends of the first and second angle members, and with the fourth angle member extending between the second ends of the first and second angle members, to define a generally rectangular outer configuration, and a central opening,



means fastening said support frame to the first and second surfaces of said first and second plate members, with the longitudinal axis of the safety assembly being oriented to extend between two diagonally opposite corners of said support frame, said support means including fastener devices which connect the first and second portions of the first plate member to the third and second angle members, respectively, and fastener devices which connect the first and second portions of the second plate member to the first and fourth angle members, respectively,

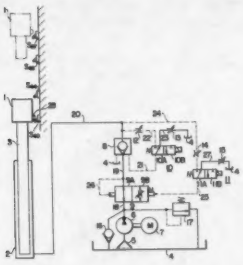
a platform assembly including a floor member having first and second flat major opposed surfaces, the edges of which define a generally rectangular configuration, and at least first and second spaced, parallel floor beam members fixed to the second major surface of said floor member, and

resilient means fastening said platform assembly to said support frame, with said resilient means including a plurality of discrete resilient members disposed between said first floor beam member and said first angle member, and between said second floor beam member and said second angle member.

4,249,641
SPEED CONTROL SYSTEM FOR HYDRAULIC ELEVATOR

Mitsuaki Takenoshita, and Masayuki Shigeta, both of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 14, 1978, Ser. No. 960,613
Int. Cl.[3] B66B 1/00
U.S. Cl. 187—29 A 5 Claims



1. A speed control system for a hydraulic elevator of the type in which an elevator cage is moved in response to a vertically extending plunger which is mounted in a hydraulic cylinder to move therein upward or downward, selectively, by applying to or discharging from the hydraulic cylinder a pressurized fluid through a hydraulic pump, which may be driven selectively with forward or reverse rotation, said speed control system comprising:

a three-phase induction motor capable of being driven in forward or reverse direction in driving connection with said hydraulic pump, said motor including a set of three-phase windings and being capable of being driven at high or low speed selectively by changing the configuration of the connection thereof to a power supply to change the number of poles of the windings;

fluid path means providing a fluid path connecting said hydraulic cylinder to a fluid source through said hydraulic pump in order to supply to or discharge from said hydraulic cylinder pressurized fluid through said hydraulic pump;

direction selector means connected to said three-phase windings for selecting the direction of rotation of said three-phase induction motor in accordance with the direction to which the elevator cage is to travel in a manner that said hydraulic pump is operated in a forward direction for upward travel of the elevator cage and in a reverse direction for downward travel thereof; and

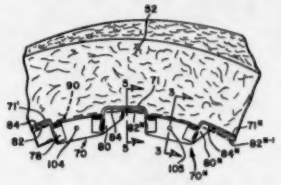
speed control means connected to said three-phase windings for controlling the running speed of said elevator cage, said speed control means including pole-number changing means for changing the connections of said windings to a power supply and thereby changing the number of the poles of said windings of said three-phase induction motor in accordance with whether the cage is to be run at high or low speed, in such a manner that said hydraulic pump is driven at high speed for high speed running of the elevator cage and at low speed for low speed running thereof.

4,249,642
OXIDATION INHIBITING CAP FOR A CARBON FRICTION DISC

Bruce W. Anderson, Niles, Mich.; Gregory M. Jessup, and Robert B. Preniczny, both of South Bend, Ind., assignors to The Bendix Corporation, Southfield, Mich.

Filed Nov. 6, 1978, Ser. No. 958,213
Int. Cl.[2] F16D 65/12
U.S. Cl. 188—73.2 10 Claims

4. In a wheel and brake assembly having a key slot coupling through which a plurality of carbon friction discs are moved toward each other during a brake application by an actuator to develop a braking torque, each of said carbon friction discs having a series of splines separated by root sections, said splines and root sections being protected by cover means to

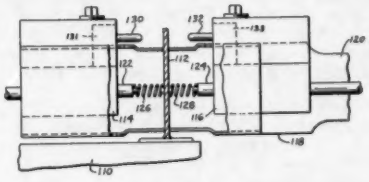


reduce degradation of the carbon friction discs by an oxidizing atmosphere, the improvement wherein said cover means extend into said root sections and engage adjacent carbon friction discs on each brake application to maintain said protection after repeated brake applications.

4,249,643
METHOD AND APPARATUS FOR ACTUATING TRAILER BRAKES

Herbert G. Yoder, Bellefontaine, Ohio, assignor to Yoder Brake & Manufacturing Co., Inc., Urbana, Ohio

Filed Nov. 4, 1976, Ser. No. 738,755
Int. Cl.[3] B60T 7/20
U.S. Cl. 188—112 R 5 Claims



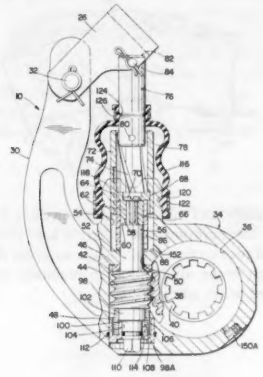
1. An actuator device for actuating trailer vehicle brakes in response to relative fore and aft movement between a trailer vehicle and a towing vehicle connected to the trailer vehicle, said device comprising; a frame adapted for connection to one of said vehicles and a rod reciprocable in the frame in the fore and aft direction and adapted for connection to the other of said vehicles, a pair of master cylinders in said frame each having a master piston therein and each master piston operable for displacing fluid from the respective master cylinder in response to movement of said rod in a respective one of said fore and aft directions from a centered position thereof in said frame, individual spring elements resilient in the fore and aft directions and bearing between said rod and each of said master pistons, means connected to said master cylinders and adapted for actuating the brakes of the trailer vehicle in response to the displacement of fluid from said master cylinders, expansion chamber means in said frame connected to receive fluid displaced from said master cylinders when the pressure thereof is above maximum brake actuating pressure, and release means operable for releasing fluid from each master cylinder when the pressure therein exceeds a predetermined amount so as to release the trailer brakes connected to the respective cylinder.

4,249,644

SLACK ADJUSTER

John A. Urban, Livonia, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 29, 1979, Ser. No. 43,583
Int. Cl.³ F16D 65/56
U.S. Cl. 188—196 D **16 Claims**



1. An improved automatic slack adjuster of the clearance sensing type for brakes of the type having a running clearance adjustable by controlled rotation of a control member, said adjuster utilizing a helically wound spring clutch wrapped around the adjacent ends of a driving shaft and a driven shaft, said control member drivingly engaged with said driven shaft, the outer diameter of said ends being substantially equal, said spring clutch in the relaxed position having an inner diameter slightly less than the outer diameter of said adjacent shaft ends and defining in part a drive mechanism adapted to transfer torque in one direction of rotation only and to slip when the torque required to rotate the second shaft exceeds a predetermined limit, substantially all of the surface of at least one of said shafts under said spring clutch being provided with a deposit of material different from the remainder of the shaft, the improvement comprising:

said one of said shafts being provided with a groove defined by a first generally radially extending wall adjacent the end of said one shaft closest the other shaft and a second generally radially extending wall spaced axially further from said outer shaft, a shoulder defined by said first wall and the end of said one shaft closest said other shaft, said deposit received in said groove and terminating at said shoulder, the outer diameter of said deposit and said shoulder being substantially equal.

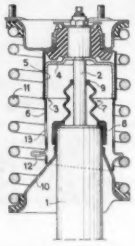
4,249,645

PROTECTING DEVICE IN PARTICULAR FOR A ROD OF A TELESCOPIC SHOCKABSORBER

Jean-Paul Level, Belfort, and Guy Buffard, Montbeliard, both of France, assignors to Automobiles Peugeot and Societe Anonyme Automobiles Citroen, both of Paris, France

Filed May 14, 1979, Ser. No. 38,427
Claims priority, application France, May 29, 1978, 78 15931
Int. Cl.³ F16F 9/38
U.S. Cl. 188—322 **8 Claims**

1. In a unit comprising a structure and a slidable member which is coaxial with said structure and has a first portion axially slidably mounted in said structure and a second portion extending axially out of a first end of said structure, the slidable member and said structure normally undergoing relative axial reciprocating motion, such as a rod and a body of a shockabsorber, and means for shielding said second portion of the slidable member from projections of undesirable foreign bodies; the improvement wherein said shielding means comprise a flexible substantially elastomeric tube substantially coaxial with and fixed to the slidable member adjacent a first end of the tube, the tube axially extending from said first end of the tube alongside said second portion of the slidable member and beyond said first end of said structure and alongside at least a portion of said structure in all relative axial positions of the slidable member and said structure, and terminating in a free end edge which is capable of encountering a part of said structure axially remote from said first end of said structure and causing an axial crushing of the tube when the slidable member



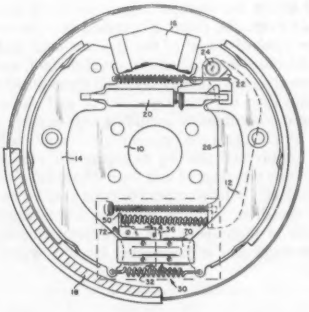
penetrates said structure in excess of a given extent, the tube comprising in a region of the length of the tube adjacent said free end edge at least one series of throughway slits which are spaced apart around the periphery of the tube and extend in a direction substantially parallel to the generatrices of the tube, the axial distance between said first end of said structure and said part of said structure being such that when said free end edge of the tube encounters said part of said structure said slits do not surround said second portion of the slidable member but surround said structure.

4,249,646

DRUM BRAKE ASSEMBLY WITH NON-SERVO AND DUO-SERVO CHARACTERISTICS

James K. Roberts, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Feb. 21, 1979, Ser. No. 12,991
Int. Cl.³ F16D 51/22
U.S. Cl. 188—328 **10 Claims**



1. In a drum brake assembly having a pair of brake shoes which are engageable with a rotatable member during a brake application, said brake shoes having pairs of confronting ends, an expansible actuator received between one pair of said confronting brake shoe ends to move said brake shoes into engagement with said rotatable member, a backing plate supporting the pair of brake shoes, a parking lever cooperating with the pair of brake shoes to move the latter into engagement with the rotatable member to effect a parking brake application respon-

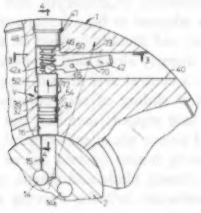
sive to movement of said parking lever to a brake applied position, characterized by means cooperating in a first position with the other pair of confronting brake shoe ends to pivotally anchor the pair of brake shoes to the backing plate, said means spacing apart said other pair of confronting brake shoes ends, said means further being responsive to movement of the parking lever to the brake-applied position to move to a second position to release the pivotal anchor between the pair of brake shoes and the backing plate, said means including a plate extending between and engageable with the other pair of confronting brake shoe ends to define a substantially invariant spacing between said other pair of confronting brake shoe ends, said plate being movably carried by said backing plate, and said means also including a latch cooperating with said plate to lock said plate to the backing plate when said means is in the first position, thereby preventing movement of said plate.

4,249,647

FRICTION CLUTCH HAVING A CENTRIFUGALLY ACTUATED HYDRAULIC CONTROL VALVE

Joseph B. Snoy, and Richard D. Preston, both of Rockford, Ill., assignors to Twin Disc, Incorporated, Racine, Wis.

Filed Feb. 1, 1979, Ser. No. 8,347
Int. Cl.[3] F16D *43/284*
U.S. Cl. 192—103 FA **3 Claims**



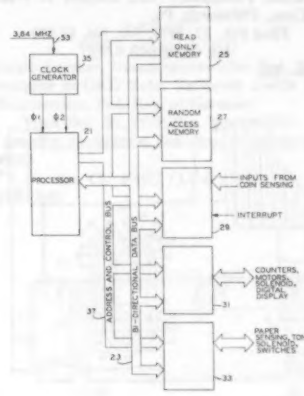
1. A hydraulically actuated friction clutch mechanism of the type having a rotatable housing which together with an axially slideable ring-like piston define an expansible clutch actuating chamber that is pressurizable to cause clutch engagement, said housing having a valve including a valve element generally radially slideable in said housing for controlling pressure fluid in said chamber, said shiftable valve element being subjected to centrifugal force when said mechanism is rotating to urge said valve element in a radially outward direction whereby centrifugal force on said valve element increases as the rotational speed of said mechanism increases, said valve element being shiftable to a radially inward closed position and a radially outward clutch actuating position, passage means defined by said mechanism for admitting pressure fluid to said valve at a location generally radially inwardly of said valve, and a counterweight shiftably mounted in said housing and having one end engagable with said shiftable valve element, centrifugal force also acting on said counterweight to urge the mass of said counterweight in an outward direction and which simultaneously urges said one end of said counterweight in a radially inward direction and against said shiftable valve element to thereby counter-balance the centrifugal force acting on said shiftable valve element whereby the capacity of the clutch mechanism remains substantially the same at all centrifugal speeds thereof.

4,249,648

TOKEN IDENTIFYING SYSTEM

John A. Meyer, Buffalo Grove, Ill., assignor to Keene Corporation, New York, N.Y.

Filed Apr. 27, 1978, Ser. No. 900,497
Int. Cl.[3] G07D *5/02*
U.S. Cl. 194—102 **19 Claims**



1. A system for receiving tokens comprising:

a token chute;

a light source disposed on one side of the token chute;

an array of light sensing elements disposed to the side of the token chute opposite the light source;

a relatively transparent region in the token chute intermediate the light source and the array;

means for interrogating the array a plurality of times during the passage of a token through the transparent region including register means for receiving and storing an analog indication of the light incident on a corresponding light sensing element, means for comparing the stored analog indication to a reference analog indication and for providing a first digital indication when the stored analog indication is less than the reference analog indication and a second digital indication when the stored analog indication exceeds the reference analog indication, a counter repetitively sequentially incrementable during each cycle thereof between minimum and maximum counts, means operable once during each counter cycle for updating all of the register means analog indications and for resetting the light sensing elements to an initial condition, and means operable upon sequential counter incrementations to supply the analog indication from the register means serially to the means for comparing;

means for identifying light to dark and dark to light transitions within the array during each interrogation thereof including first and second registers, means for transferring the contents of the counter to the first register upon the first occurrence of the first digital indication during each counter cycle, means for transferring the contents of the counter to the second register upon each occurrence of a first digital indication followed directly by a second digital indication, successive transfers obliterating the prior contents of the second register;

means responsive to the identifying means for providing an indication of the length of a chord of the token; and

processing means for storing successive token chord length indications, selecting the indication of the largest chord length, comparing that largest chord length indication with each of a plurality of different acceptable token indications, and identifying the token as a particular acceptable type if the indication of the largest chord length

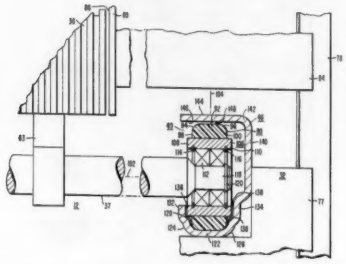
matches the corresponding particular acceptable token indicator.

4,249,649

ESCALATOR HAVING YIELDABLE PRIMARY AND NON-YIELDABLE SECONDARY TRANSVERSE GUIDE POINTS ON ONE SIDE THEREOF

Joseph K. Kraft, Parsippany, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 22, 1979, Ser. No. 13,870
Int. Cl.³ B66B *9/12*
U.S. Cl. 198—332 **4 Claims**



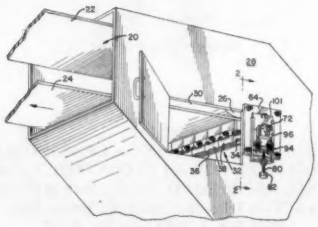
1. An escalator, comprising:
an endless belt having first and second sides;
a plurality of steps attached to said endless belt;
means for driving said endless belt in a loop which includes load-bearing and return runs for said steps;
skirt means disposed to provide substantially vertical side walls adjacent to said steps, with a predetermined running clearance therebetween having a normal dimensional range which includes a normal minimum dimension;
a plurality of guide wheels rotatably mounted on the first side of said endless belt;
said guide wheels having a compressible tread portion;
said guide wheels having a substantially incompressible hub portion;
said tread portion having a flat cross-sectional configuration at its outer periphery, inner and outer side wall portions, and outwardly curved inner and outer edges which interconnect the outer periphery with the inner and outer side wall portions, respectively;
said hub portion being a tubular structure having first and second ends which extend outwardly past the inner and outer edges, respectively, of said tread portion;
a guide track on the first side of said endless belt;
said guide track having a flat support portion for supporting the flat outer periphery of the tread portion of said guide wheels, and inner and outer primary guide surfaces which extend upwardly from the flat support portion, said inner and outer primary guide surfaces being spaced to cooperate with the inner and outer edges, respectively, of the tread portion of said guide wheels, to define first and second primary guide points, respectively, which guide the endless belt within a first predetermined dimensional range from a desired tracking centerline when the endless belt is subjected to normal side thrust forces;
said guide track having portions which continue upwardly from both the inner and outer primary guide surfaces to define inner and outer secondary guide surfaces;
said inner and outer secondary guide surfaces being spaced to cooperate with the first and second ends, respectively, of said hub portion to define first and second secondary guide points, respectively;
said first and second secondary guide points becoming operative after abnormal side thrust forces compress an edge of said tread portion to force the endless belt beyond one of the first and second primary guide points, but before the endless belt and its connected steps move laterally by a dimension equal to the minimum normal running clearance, to provide positive limits on the lateral movement of said endless belt and steps which preclude contact between said steps and said skirt means on either side of said endless belt, while guiding said endless belt solely from the first side thereof.

4,249,650

BELT CLEANER MOUNTING ARRANGEMENT

Richard Stahura, Indiana, Pa., assignor to Martin Engineering, Neponsit, Ill.

Continuation of Ser. No. 902,351, May 3, 1978, and a continuation of Ser. No. 757,908, Jan. 10, 1977. This application Oct. 22, 1979, Ser. No. 86,645
Int. Cl.³ B65G *45/00*
U.S. Cl. 198—499 **10 Claims**



1. A mounting arrangement for conveyor belt cleaners including a linearly extending support member positioned transverse to the direction of conveyor belt travel; at least one sleeve member adapted to be concentrically mounted on said support member and slidably carried on said support member for movement linearly along said support member in a direction parallel to a central axis of said support member; means adapted to allow sliding of said concentric sleeve member linearly along said support member, but adapted to prevent rotation of said sleeve about said central axis of said support member, mounting means on said sleeve member adapted to support a belt cleaner blade and means, operable from either side of said conveyor belt for moving said sleeve member linearly along said support member.

4,249,651

RECLAIMING BUCKETS FOR A STOCKPILE RECLAIMER

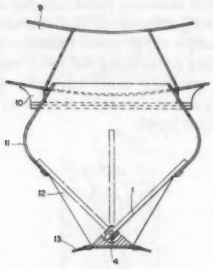
Richard Krükemeier, Porta Westfalica; Uwe Merten, Bielefeld, and Willi Stahlmann, Bad Oeynhausen, all of Fed. Rep. of Germany, assignors to Weserhütte AG, Fed. Rep. of Germany

Filed Mar. 5, 1979, Ser. No. 17,334
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1978, 2810599
Int. Cl.³ B65G *65/02*
U.S. Cl. 198—509 **2 Claims**

1. In a double bucket attached at the circumference of a bucket wheel or of a bucket drum for a stockpile reclaimer, adapted to revolve in a circular path and effective in picking up material in either direction of rotation of the bucket wheel or bucket drum, and which is provided with scraper blades connected to parallel side walls or partition walls of the bucket; and with a bucket backplate pivotally supported at the side walls or partition walls of the bucket by means of a shaft or stub shafts, the bucket backplate being capable of pivoting within the space of the bucket and thus acting in the same manner for both directions of rotation to carry collected stockpile material upwardly either on one face or on the other, depending upon the direction of rotation,

the improvement comprising at least one braking means

connected on one side to the shaft of the bucket backplate and on the other side to the side wall of the bucket,



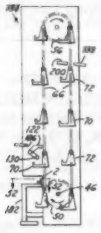
whereby the bucket backplate is prevented from pivoting due to the influence of its own weight.

4,249,652

WORKPIECE VERTICAL CONVEYOR SYSTEM

John H. Brems, 32867 White Oaks Trail, Birmingham, Mich. 48010

Filed Jul. 17, 1978, Ser. No. 925,216
Int. Cl.³ B65H *37/00, 47/26, 17/12*
U.S. Cl. 198—796 **18 Claims**



1. In an article carrier system, in which articles are transferred from one point to another, while supported by pallets, means for loading said articles into said pallets comprising:

A. an endless conveyor disposed in a generally vertical direction, and having a first portion moving in a generally upward direction and a second portion moving in a generally downward direction,

B. drive means for moving said endless conveyor in said given directions,

C. an article support member positioned adjacent said first portion of said conveyor,

D. a first support member adapted to support a pallet and positioned adjacent said first portion of said conveyor,

E. a second support member adapted to support a pallet and positioned adjacent said second portion of said conveyor,

F. one or more pallet conveying members of one type spaced along said conveyor,

G. one or more article conveying members of a second type spaced along said conveyor in alternating positions with said pallet conveying members,

H. the conveying members and the support members being interdigitally related such that said empty conveying members can pass by all said empty support members and said article conveying members are adapted to pick up articles from said article support member and said article conveying members are adapted to pass by a pallet supported on said second support member,

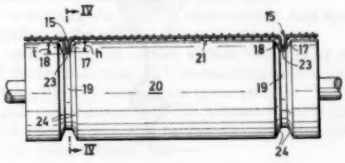
whereby said article conveying members pick up articles at said article support member and said pallet conveying members pick up empty pallets at said first supporting member, and whereby a pallet conveying member deposits an empty pallet on said second support member and the following article conveying member deposits an article into said pallet on said second support member, thereby loading said pallet.

4,249,653

WIRE MESH BAND

Karl Kufferath-Kassner, Duren-Mariaweiler, Fed. Rep. of Germany, assignor to GKD Gebr. Kufferath GmbH & Co. KG, Duren-Mariaweiler, Fed. Rep. of Germany

Filed Dec. 28, 1979, Ser. No. 108,032
Claims priority, application Fed. Rep. of Germany, Jan. 11, 1979, 2900868
Int. Cl.³ B65G *15/54, 15/30*
U.S. Cl. 198—848 **10 Claims**



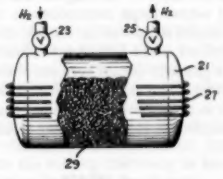
1. A wire mesh band for a conveyor system with driving rollers and return rollers having guide grooves on the circumference thereof: said band having mutually crossing warp wires and weft wires; said warp wires being oriented longitudinally in the transport direction and grouped into warp wire lanes having warp free lanes disposed therebetween; said weft wires being bent downwardly in said warp wire free lanes forming protrusions extending downwardly beyond the lower surface of said band such that said warp wire lanes are in close transverse proximity in said band and said protrusions are warp wire free.

4,249,654

HYDROGEN STORAGE APPARATUS

Frederick D. Helversen, 300 Sand Hill Cir., #206, Menlo Park, Calif. 94025

Filed Sep. 25, 1979, Ser. No. 78,777
Int. Cl.³ F17C *11/00;* **C01B** *1/26;* **B65D** *25/00;* **F16L** *55/04*
U.S. Cl. 206—0.7 **12 Claims**



1. Apparatus for storing hydrogen comprising:

a container having at least one valved port;

a plurality of particles disposed within said container, said particles including:

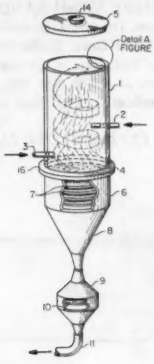
a carrier substance; and

a hydride forming metal vapor deposited on the surface of said carrier substance to form a coating; said metal coating being capable of adsorbing and releasing hydrogen gas.

4,249,655
CYCLONE DUST ANALYZER FOR DETERMINING MICRODUST CONTENT IN FIBERS

Myles A. Patureau, New Orleans, La., and Michael F. Murray, Newville, Ala., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jun. 29, 1979, Ser. No. 53,476
Int. Cl.³ B07B *7/06, 9/02*
U.S. Cl. 209—31 **13 Claims**



1. An apparatus for removing filter dust particles from fiber for sampling and analysis comprising:

(a) a first upper cylindrical chamber having an opening on the bottom end thereof and containing a preconditioned and preweighed fiber sample, said sample containing fiber dust particles to be removed and analyzed;

(b) an upper, tangential air jet, located into and through the wall of the first upper cylindrical chamber and periphery tangential to the periphery or inner surface of said first chamber, thus, enabling air to be directed in a tangential manner into the fiber sample contained therein, thereby causing the fiber sample to swirl inside the first chamber in a cyclonic motion when a negative pressure is applied to first chamber and thus liberate fiber dust particles from the fiber sample;

(c) a radial air jet affixed into and through the wall of the first upper cylindrical chamber, said radial air jet being located parallel to the radius of the first cylindrical chamber so as to direct air in a radial manner to tumble the fiber sample in a rolling motion and blow air over a filter screen;

(d) said filter screen affixed to the opened bottom end of said first upper cylindrical chamber to entrap the liberated fiber dust particles for subsequent analysis.

(e) a funnel whose large circumference opening is complimentary to and affixed to the outside circumference of the opened bottom of the first upper cylindrical chamber thus forming a pressure fitting between the base of said cylindrical chamber and said funnel juxtaposed below the filter screen so as to receive the exhaust from the upper cylindrical chamber through said filter screen.

4,249,656
SUTURE PACKAGE

Robert J. Cerwin, Pittstown, and Robert H. Yolinsky, Bridgewater, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Oct. 15, 1979, Ser. No. 84,921
Int. Cl.³ A61L *17/02*
U.S. Cl. 206—63.3 **13 Claims**

1. An elongated, folded retainer for needled surgical sutures comprising

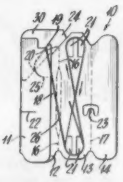
(a) first needle cover panel;

(b) a second needle retaining panel foldably connected to said needle cover panel along one major edge thereof;

(c) a third suture retaining panel foldably connected to said needle retaining panel along the other major edge thereof;

(d) a fourth suture cover panel foldably connected to said suture winding panel along the other major edge thereof;

said needle retaining panel having a die cut extending diagonally across the width thereof to define a separate needle access panel;



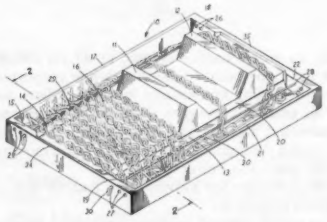
said foldline between said needle retainng panel and said suture retaining panel including a gusset over a substantial portion thereof;

whereby when said retainer is in its folded configuration with a needled suture contained therein, said surgical suture extends from said needle retaining panel across said gusset to said suture retaining panel, and said gusset in combination with said panels forms a channel through which the suture traversing said panels may be drawn when removing said suture from said retainer.

4,249,657
TIRE CHAIN HOLDER

Kenneth L. Bates, 1003 SW. Palatine St., Portland, Oreg. 97219

Filed Jun. 25, 1979, Ser. No. 51,691
Int. Cl.³ A44B *7/00*
U.S. Cl. 206—335 **2 Claims**



1. A tire chain holder comprising:

a pair of bases, spaced apart, each of which is surrounded by upstanding edges forming a pair of trays, each with lateral sides and end sides, which contain in the end sides means of retaining locking devices; and

a raised platform with an upper and lower surface formed in conjunction with one of the lateral sides of each tray and extending between the pair of trays; and

configured upon the upper surface of the platform, a raised edge, a length of platform, a raised mound, a shorter length of platform, a like raised mound, a like shorter length of platform, a like raised edge; and

configured within the lower surface of said platform vertical ribs which intersect longitudinally and transversely one with the other; and

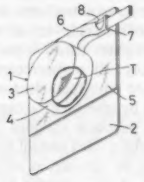
locking devices retained by and extending between the end sides of each tray.

4,249,658

CASE FOR A TAPE

Kiyoshi Ogura, 1-7-203, Takeshirodai 2-cho, Sakai-shi, Osaka-fu, Japan

Filed Jul. 10, 1979, Ser. No. 56,248
Claims priority, application Japan, Jul. 12, 1978, 53-96674[U]; Sep. 13, 1978, 53-127761[U]
Int. Cl.³ B65D 85/67
U.S. Cl. 206—409 5 Claims



1. A case to enclose a rolled length of foldable tape comprising:

a base plate, and

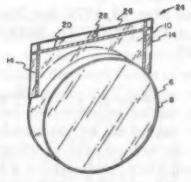
an integral cover fastened to the base plate, the cover having a roll enclosing portion comprising a top wall, a cylindrically shaped side wall and a guide through which tape may be pulled, said guide extending substantially tangentially from said side wall of said roll enclosing portion, the top wall of said guide being tapered from the point at which said guide attaches to said roll enclosing portion toward the outlet of said guide, whereby as the tape passes through said guide the tape is folded longitudinally.

4,249,659

HEAT SHRUNK PACKAGE

Henry G. Schirmer, Spartanburg, S.C., assignor to W. R. Grace & Co., Duncan, S.C.

Continuation of Ser. No. 895,202, Apr. 10, 1979, abandoned. This application May 7, 1979, Ser. No. 36,917
Int. Cl.³ B65D 65/04, 85/00
U.S. Cl. 206—471 2 Claims



1. A package comprising:

(a) an article;

(b) a single thermoplastic film sheet enclosing said article, said film sheet comprising:

(1) a shrunken portion closely conforming to the shape of said article, said shrunken portion having been previously stretched, and

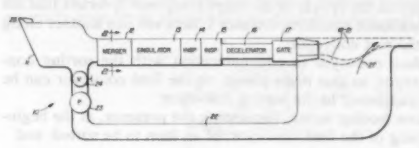
(2) a flange portion comprising sealed together edge portions of said sheet which seal closes said article containing shrunken portion, said flange being continuous on one side of said package and extending around approximately one half of said article, the edge portions which comprise said flange being substantially unstretched and non-shrunken.

4,249,660

POTATO SORTING APPARATUS

Sylvester L. Woodland, Wilder, Id., assignor to Aquasonics, Inc., Wilder, Id.

Filed May 10, 1979, Ser. No. 37,861
Int. Cl.³ B07C 5/00
U.S. Cl. 209—555 14 Claims



1. A hydraulically actuated agriculatural product sorting apparatus comprising:

a hydraulic system for buoyantly supporting and transporting items of the product along a given path,

a hopper containing the product connected to said system for introducing the product into said system,

merging means mounted in said system for aligning each item of the product received from said hopper in sequence for moving the items along said given path,

said merging means comprising two counter-rotating spirals mounted side by side and having the same number of spirals per unit of length,

a singulator placed downstream from said merging means in said system for receiving in sequence said items and uniformly spacing them one from the other,

at least one inspection station placed downstream from said singulator for sensing and inspecting individually each item moving along said path,

gating means,

at least two different hydraulic channels,

said gating means actuated by said station moving the items through one of said channels depending on the results observed by said station, and

means for returning at least a part of the hydraulic medium of said system discharged downstream of said hopper to substantially the beginning of said path.

4,249,661

CONVEYOR SORTATION SYSTEM

Hans J. Lem, 185 Rte. 17, North, Mahwah, N.J. 07430

Filed Jun. 9, 1978, Ser. No. 914,155
Int. Cl.³ B65G 47/30
U.S. Cl. 209—564 12 Claims

1. A conveyor system, for directing an item placed onto the system to a particular one of a number of different locations, comprising:

a sorting conveyor capable of receiving items placed onto the system;

a system of at least one diverter stationed at known interval(s) along and from a known point on the sorting conveyor, and capable of causing an item on the sorting conveyor to be directed to any of a plurality of different locations;

a first sorting means, for determining which, if any, diverter must be activated to cause a particular item which has been placed on the sorting conveyor to be directed to a particular location desired for such item;

a second sorting means, responsive to the first sorting means, for determining when the item upon which the first means has operated has reached any diverter determined by the first means to be required to be activated to cause the item to be directed to the desired location;

a third sorting means, responsive to the second means, for activating the pertinent diverter when the particular item has reached the diverter;

wherein the second sorting means includes:

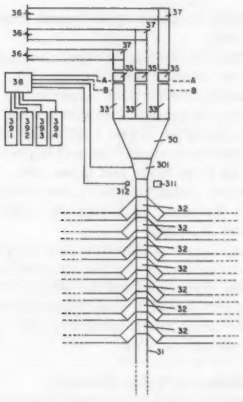
a fourth sorting means, for sensing the presence of an item at the beginning of the sorting conveyor;

a timer for timing an interval, dependent on the definite integral of the sorting conveyor speed over time, that is commenced by sensing by the fourth sorting means of an item and that continues until the sorting conveyor has carried, to the pertinent diverter, the item which the fourth sorting means has sensed;

wherein the system of diverters comprises diverters that are stationed a uniform distance L between one another along the sort conveyor;

a feed conveyor in communication with the sorting conveyor, so that items placed on the feed conveyor can be transferred to the sorting conveyor;

a first feeding means, for sensing the presence, at the beginning of the feed conveyor, of an item to be sorted; and



a second feeding means, responsive to the first feeding means, for controlling the speed of the feed conveyor and thus entry of an item onto the sorting conveyor so that the feed conveyor is capable of receiving items one after another at desired spacing intervals wherein the first feeding means comprises means for optical detection of an item, said optical detection means including a light source, aimed transversely to the flow path along the feed conveyor and stationed near the beginning of flow along the feed conveyor;

a fifth sorting means, responsive to the fourth sorting means, for controlling the speed of the sorting conveyor and the entry of an item onto the sorting conveyor, so that the sorting conveyor need be operated only when necessary.

4,249,662

DATA REGISTER

Hans Halm, Herne, Fed. Rep. of Germany, assignor to Confon AG, St. Gallen, Switzerland

Filed Sep. 11, 1978, Ser. No. 941,170

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1977, 2741222; Aug. 19, 1978, 7824814[U]

Int. Cl.³ B07C *3/20*

U.S. Cl. 209—610 **1 Claim**

1. A data register with a register card selection mechanism comprising a housing which has a cover and a base with a plurality of selector keys which are juxtaposed and superimposed in rows and a drawer which is under the action of a compression spring and which is closable by means of a locking mechanism, whereby a large number of register cards are stacked in said drawer with selection tongues having openings formed in the rear edge portions thereof, said tongues increasing in size in step-like manner by, in each case, one opening-containing selection tongue from one side to the other side of the register card with the first opening disposed opposite the first opening of the preceeding register card, whereby each selection key is fixed to a swivel arm constructed as a lever which at its free end carries a card restraining pin, whereby the card restraining pins of swivel levers are arranged in a row and cooperate with the register cards in such a way that, on depressing a selector key, all register cards located above the register card associated with this selector key are held back on extending the drawer by inserting the card restraining pins into the openings of the selection tongues of the register cards, while the selected register card and all the cards located below it are moved out with the drawer, as well as a device operable by the swivel levers of the selector keys for unlocking the drawer and releasing the register cards selected by a selector key by forcing out the unlocked drawer by means of the compression spring and provided with a cam for engaging with cam perforations on the register card, wherein the card restraining pin of each swivel lever comprises an approximately U-shaped portion shaped onto the end of the swivel lever with a leg leading to the selector keys onto whose end is shaped a vertically upwardly directed rod which on operating a swivel lever engages from below into the register card opening or recess, wherein the improvement comprises that said vertically upwardly directed rod of said U-shaped portion of said card restraining pin has an upwardly extending diagonally formed surface facing toward said selection keys and said diagonally formed surface extending obliquely upwardly relative to the vertical direction, and said vertically upwardly directed rod has a rear bent portion extending transversely of the upper part of said rod in the direction opposite to the direction in which said diagonal formed surface faces and said rear bent portion being smaller than the openings formed in the rear edge portions of said register cards.

4,249,663

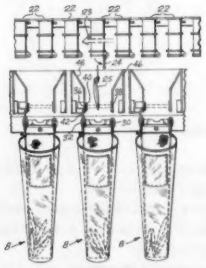
CONVERTIBLE LOADING AND SHIPPING POUCH AND MOUNTING MEANS FOR AUTOMATED PHOTOGRAPHIC CUSTOMER ORDER SORTING DEVICE

Malcolm L. Hewlett, Bellingham, Wash., assignor to CX Corporation, Seattle, Wash.

Filed Mar. 23, 1979, Ser. No. 23,244

Int. Cl.³ B07C *7/04;* **B65B** *67/04*

U.S. Cl. 209—705 **13 Claims**



1. A convertible article loading and delivery pouch adapted to be removably mounted with its top open to receive articles at a loading station, said pouch comprising opposite sidewalls interconnected by a rear wall, said sidewalls having upper edge portions with mounting means thereon adapted to de-

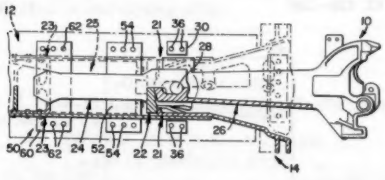
mountably engage external support arms for maintaining the sidewalls upper edge portions at a predetermined spacing at the front of the pouch, and a front wall of a width greater than said predetermined spacing interconnecting said sidewalls, said front wall being of stiffly flexible material tending to maintain an outwardly bowed configuration maintaining the pouch open at the top with the pouch thus suspended, said front wall being adapted to be bowed inwardly against the rear wall and sidewalls in order to close the top of the pouch with the pouch demounted from said support arms, and cooperating closure elements on the upper edge portions of the front wall and on said side and rear walls interengageable to secure the pouch closed with the front wall thus bowed inwardly.

4,249,664

RIGIDIFYING ARRANGEMENT FOR SELF LUBRICATING YOKE WEAR PLATE ASSEMBLIES

Richard F. Murphy, Batavia, Ill., assignor to Holland Company

Filed Jul. 30, 1979, Ser. No. 61,933
Int. Cl.³ B61G *7/10*
U.S. Cl. 213—61 **6 Claims**



1. In a draft gear rigging for railroad cars having a channel shaped center sill opening downwardly and extending longitudinally of the car, with the rigging mounted at the end of the car and comprising a draft gear applied within the draft gear pocket between stops spaced longitudinally of the car and within the center sill, which draft gear is embraced by a yoke extending longitudinally of the car and operably connected to the car coupler, with the yoke being supported by a support plate secured at its ends at the underside of the center sill, said support plate being planar in configuration and paralleling and being coplanar with the underside of the center sill, and including a liner formed from a polymer of dry self lubricating characteristics and interposed between the support plate upper side and the yoke underside on which the yoke inner end rides to dispose the yoke underside at its operative level within the center sill,

the improvement wherein:

the support plate has fixed to its underside along the longitudinal midportion of same a depending flange structure including a vertically disposed flange of rectilinear configuration defining an upper side portion made fast to the support plate and a lower side portion spaced vertically below the support plate and defining a horizontal flange projecting normally of said vertical flange for rigifying the support plate in its planar configuration against the weight of the draft and yoke riding on the liner.

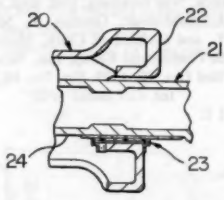
4,249,665

RAILWAY VEHICLE WEAR MEMBER

Donald L. Kleykamp, Springboro, Ohio, assignor to Dayco Corporation, Dayton, Ohio

Filed Aug. 6, 1979, Ser. No. 64,229
Int. Cl.³ B61F *1/08*; B61G *7/00*; B61F *9/20*; F16C *33/20*
U.S. Cl. 213—61 **9 Claims**

1. In a wear member for a railway vehicle wherein said vehicle comprises a pair of relatively movable components and said wear member is adapted to be supported by one of said components and protects said components from wear during relative movement thereof; said wear member comprising; a metal support adapted to be supported on said one component; a liner attached to said metal support, said liner having opposed surfaces comprising an inner surface thereof disposed adjacent said metal support and a smooth anti-friction outer wear surface engageable by said other component; said liner comprising, an ultra high molecular weight polymeric material defining said opposed surfaces, and a metal structure embedded substantially centrally between said opposed surfaces of said polymeric material which serves as a matrix for and substantially completely surrounds said metal structure, said metal



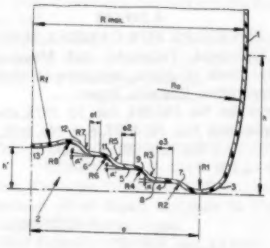
structure having openings therein which receive said polymeric material completely therethrough and provide better embedment of said metal structure, said structure providing reinforcement and preventing cold flow of said polymeric material; the improvement comprising, a plurality of metal members extending between said metal structure and said metal support through polymeric material disposed between said metal structure and metal support and its associated one of said opposed surfaces, and weld means welding said metal members in position to said metal support.

4,249,666

HOLLOW BODY OF THERMOPLASTIC MATERIAL

Guy Hubert, Lasne-Chapelle-Saint-Lambert, and Roger Dechenne, Strombeek Bever, both of Belgium, assignors to Solvay & Cie, Brussels, Belgium

Filed Mar. 2, 1978, Ser. No. 883,032
Claims priority, application France, Mar. 2, 1977, 77 06680
Int. Cl.³ B65D *6/38, 8/12*
U.S. Cl. 215—1 C **7 Claims**



1. In a molded, molecularly oriented hollow body of thermoplastic material including a side wall of generally cylindrical shape, a reentrant base, and a peripheral annular support radially connecting the lower end of the side wall to the outer edge of the base, the improvement wherein said base comprises more than two substantially planar, axially staggered, concentric annular zones of respectively different widths, which widths increase progressively in the direction from the center of said base, each said concentric annular zone being inclined relative to the longitudinal axis of said hollow body such that when said body is standing upright on its base, the interior edge of each said annular zone is located at a higher level than the exterior edge thereof, connecting portions of rounded cross section connecting adjacent annular zones together, a central part in the form of a spherical dome pointing towards the

exterior of said hollow body, and a further connecting portion of rounded cross section which connects said central part to the adjacent annular zone, whereby the base region of said body has an enhanced impact strength.

4,249,667

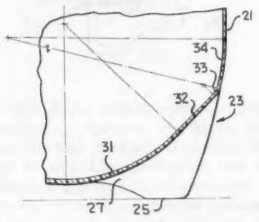
PLASTIC CONTAINER WITH A GENERALLY HEMISPHERICAL BOTTOM WALL HAVING HOLLOW LEGS PROJECTING THEREFROM

John F. E. Pocock, Neu Isenburg, Fed. Rep. of Germany; Suppayan M. Krishnakumar; Gautam K. Mahajan, both of Nashua, N.H., and Richard E. Clark, Merrimack, N.H., assignors to The Continental Group, Inc., New York, N.Y.

Filed Oct. 25, 1979, Ser. No. 88,238

Int. Cl.³ B65D *1/02*

U.S. Cl. 215—1 C **10 Claims**



1. In a blow molded plastic container of the type comprising a tubular body terminating in a generally hemispherical outwardly convex bottom wall, said bottom wall being interrupted by a plurality of circumferentially spaced hollow legs with portions of said bottom wall disposed therebetween and terminating in a lower polar portion, said hollow legs terminating in lowermost supporting feet the improvement comprising said bottom wall in axial half cross-section between an adjacent pair of said legs being in part of a constant curvature and in part other than of a constant curvature and including a constant curvature curved line portion and an intermediate straight line portion wherein said bottom has a frustoconical segment.

4,249,668

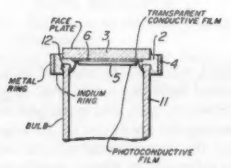
ENVELOPE FOR CAMERA TUBE

Mitsumasa Katayama, Takatsuki, and Masayasu Suemitsu, Nagaokakyo, both of Japan, assignors to Matsushita Electronics Corporation, Kadoma, Japan

Continuation of Ser. No. 546,031, Jan. 31, 1975, abandoned. This application Jun. 20, 1977, Ser. No. 808,275

Int. Cl.³ H01K *1/30*

U.S. Cl. 220—2.1 R **2 Claims**



1. An envelope for a camera tube comprising a thin-wall rectilinear bulb, a face plate, an indium ring sealed to said face plate and a metal ring surrounding said indium ring, said rectilinear bulb having one opening end thereof embedded in the wall portion of said indium ring, the improvement wherein said rectilinear bulb is provided with a deformed portion at said one opening end, said deformed portion being thicker than the rest of said rectilinear bulb and completely embedded in the wall portion of said indium ring, the surface of said deformed portion at said one opening end being flat and said deformed portion being increased in thickness substantially equally in the inward and outward directions of said thin-wall rectilinear bulb thereby providing a relatively large hermetic seal surface area between said thin-wall rectilinear bulb and said face plate, said indium ring being in pressure contact with the deformed portion of the rectilinear bulb so that the annular skirt of said indium ring has an inwardly directed bulge portion which is engaged with the downwardly shoulder of the peripheral portion of said bulb.

4,249,669

CONTAINERS AND OTHER LIQUID-HOLDING MEANS

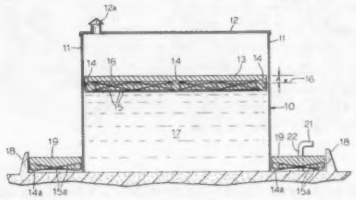
Andrew Szego, Willowdale, Canada, assignor to Explosafe America Inc., Rexdale, Canada

Filed Nov. 6, 1979, Ser. No. 91,713

Claims priority, application United Kingdom, Nov. 9, 1978, 43906/78

Int. Cl.³ B65D *88/34, 87/48*

U.S. Cl. 220—216 **21 Claims**



1. A container for inflammable liquids having an upwardly extending sidewall, a body of inflammable liquid held within the container, and a fire-extinguishing structure comprising a porous blanket extending over substantially the whole of the surface of the liquid in the container, said blanket being of heat-resistant expanded metal foil material comprising interconnected flat mesh strands defining diamond-shaped openings having interstices of non-capillary size that are sufficiently large that they permit a flame front to propagate through the blanket and means supporting said blanket in contact with said liquid and in close abutment with the container sidewall and with a thickness of the blanket material extending above the liquid surface sufficient to suppress combustion of the liquid at its surface.

4,249,670

QUICK DISCONNECT CAP HAVING PRESSURE VENTING MEANS

Charles R. Hug, Santa Rosa, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 13, 1979, Ser. No. 93,483

Int. Cl.³ B65D *43/38, 43/40, 39/00*

U.S. Cl. 220—295 **7 Claims**

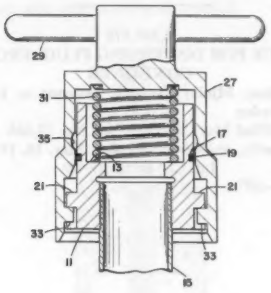
1. A quick-disconnect cap assembly comprising:

(a) means for adapting said cap assembly to the outlet of a container for gas or liquid;

(b) means for releasably capping said adapting means, said capping means having an approximately hollow cylindrical formation and a lower open and an upper closed end;

(c) means for resiliently holding said capping means over said adapting means, said holding means inside of and attached to said closed end of said capping means and fitting slidably inside said adapting means;

(d) means for forming a pressure-tight seal between said capping means and said adapting means; and



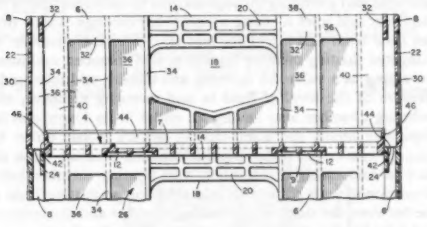
(e) means for venting pressure inside said container between said capping means and said adapting means prior to removal of said capping means.

4,249,671

CARRYING CASE

Gary M. Crolli, Erie, Pa., assignor to Rehrig Pacific Company, Los Angeles, Calif.

Filed Apr. 12, 1979, Ser. No. 29,200
Int. Cl.³ B65D *1/22, 90/02*
U.S. Cl. 220—469 **15 Claims**



1. A carrying case having a bottom wall with an upper supporting surface, and an upstanding wall connected to said bottom wall, at least a portion of said upstanding wall being hollow and comprising:

an outer wall having a substantially imperforate portion;

an inner wall spaced inwardly from said outer wall; and

a plurality of openings formed in said inner wall to expose the interior surface of the imperforate portion of said outer wall to facilitate cleaning thereof.

4,249,672

COUNTER FOR TICKET-LIKE ITEMS

Alfred F. Rossi, 503 Old Woods Rd., Wyckoff, N.J. 07481

Continuation of Ser. No. 827,682, Aug. 25, 1977, abandoned. This application Jun. 26, 1979, Ser. No. 52,252
Int. Cl.³ B65G *59/06*
U.S. Cl. 221—264 **17 Claims**

1. An item counting assembly, comprising;

(a) support means;

(b) item counting means carried by said support means;

(c) item supply means for receiving a supply of items to be counted and for directing same towards said item counting means;

(d) supply mounting means coacting with said item supply means to position same with respect to said item counting means so that items, when stored in said item supply means, are directed to said item counting means;

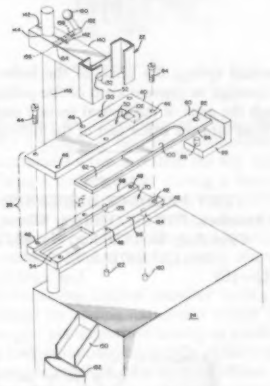
(e) said item counting means, including:

(i) first passage means disposed for communication with said item supply means to receive items therefrom and direct same into said item counting means;

(ii) second passage means for directing items out of said item counting means;

(iii) said first passage means and said second passage means being disposed in said item counting means so as to be offset one with respect to the other along a predetermined item discharge path;

(iv) an item counter, having an item receiver of predeter-



mined configuration and which is sized to receive a selected number of items;

(v) said item counter being disposed in said item counting means for movement along said predetermined item discharge path between an item receiving position, wherein said item receiver is aligned with said first passage means to receive items from the supply means therethrough, and an item discharge position, wherein said item receiver is aligned with said second passage and any items in said item receiver are discharged therethrough; and

(f) operating means disposed for coaction with said item counter to move same between said item receiving position and said item discharge position.

4,249,673

COMBUSTING DEVICE FOR GENERATION OF A COMBUSTION GAS

Masayoshi Katoh, Kawagoe; Takashi Ishii, Tokyo, and Tadahiko Nagaoka, Sayama, all of Japan, assignors to Nissan Motor company, Limited, Yokohama, Japan

Filed Feb. 21, 1979, Ser. No. 13,137
Claims priority, application Japan, Mar. 2, 1978, 53-23925
Int. Cl.³ B01J *7/00;* B60R *21/08;* F42B *3/04*
U.S. Cl. 222—3 **12 Claims**

4. A combustion device comprising:

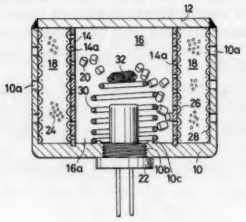
a housing defining therein a combustion chamber;

a plurality of pellets of a chemical composition, which undergoes self-sustaining combustion with generation of a combustion gas which may be in the form of flame, disposed in the combustion chamber, the housing having at least one aperture through which the combustion gas jets out of the housing;

an initiator for ignition of the pellets attached to the housing so as to be exposed to the combustion chamber;

a helical spring placed in the combustion chamber in such an arrangement that one end of the helical spring rests on a wall of the combustion chamber, that the initiator is ex-

posed to the interior of the helical spring and that the pellets are entirely spaced from the initiator by the helical spring and held under a compressive force by resiliency of



the helical spring, the pitch of the helical spring being small enough to prevent each of the pellets from passing through the gaps of the helical spring; and

a plug fitted into the other end of the helical spring.

4,249,674

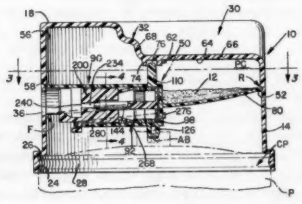
DRY PRODUCT DISPENSER

Ronald L. Antenore, 5790 SW. 16th St., Miami, Fla. 33155

Filed Aug. 10, 1979, Ser. No. 65,735

Int. Cl.[3] B67D *5/32, 5/54*

U.S. Cl. 222—153 **23 Claims**



1. A dry product dispenser comprising:

an overcap adapted to be attached to a propellant container which has a propellant dispensing means thereon, said overcap having a dispensing control means thereon and a product dispensing outlet port defined therein;

a product supporting means mounted in said overcap and defining a product storage area;

an actuator means mounted in said overcap and including a hollow cylindrical housing mounted on said product supporting means and having product receiving slots defined therein to receive product from said product storage means, a dispensing control means contacting means positioned on said housing to be actuated by said cap mounted dispensing control means, a propellant dispensing means actuating means positioned on said housing to actuate said propellant container propellant dispensing means, said actuator means including a spring element located in said hollow cylindrical housing and having a portion thereof movable and a post mounted on said movable portion for movement therewith, and a spring retainer mounted in said hollow cylindrical housing to limit movement of said spring movable portion, said actuator mechanism further including a piston element movably mounted in said hollow cylinder housing and having a fluid passage defined therethrough to fluidly connect said propellant dispensing means with said product receiving slots and said product dispensing outlet port defined in said overcap so that propellant dispensed from said propellant container intersects product received through said slots and passes out of the outlet port with product entrained therein, said product supporting means being located between said slots and the propellant container; and

a snubber on said actuator means resisting movement of said piston relative to said hollow cylindrical housing.

4,249,675

DEVICE FOR DISPENSING FLUID FROM A CONTAINER

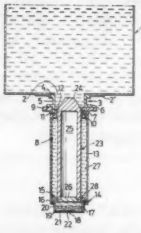
Billy N. Nilson, Mjolby, Sweden, assignor to KeNova AB, Malmo, Sweden

Filed Mar. 15, 1979, Ser. No. 20,666

Claims priority, application Sweden, Mar. 15, 1978, 7803290

Int. Cl.[3] B65D *37/00*

U.S. Cl. 222—207 **8 Claims**



1. A device for dispensing fluid from a container, said device comprising a vertically oriented metering chamber including a flexible tube forming at least a portion of the side walls of the chamber, the tube having the interior thereof in communication with said container through an inlet in the upper end of the chamber, said inlet forming a valve seat through which fluid can flow from said container into said metering chamber, an elongated floating member housed in said chamber, said member acting as a valve for opening and closing said inlet under pressure of the level of fluid in said metering chamber, said metering chamber also having an outlet in its lower end for dispensing liquid, and a self-closing closure in said outlet for opening said outlet under a predetermined pressure upon the fluid in said metering chamber, said floating member being dimensioned with respect to said tube for permitting fluid to rise between the sides of the floating member and the inside of said tube for determining the amount of fluid to be dispensed upon squeezing the tube inwardly against the sides of the floating member, the larger the area of the tube squeezed against the floating member the larger the amount of fluid dispensed in a single squeezing action.

4,249,676

AIR VENT CHECK VALVE

Floyd T. Beery, Prairie Village, Kans., assignor to Hallmark Cards Incorporated, Kansas City, Mo.

Filed May 31, 1979, Ser. No. 44,347

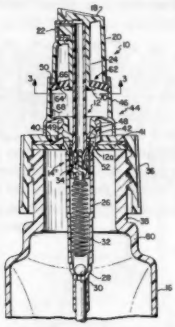
Int. Cl.[3] B05B *11/00*

U.S. Cl. 222—321 **3 Claims**

1. In a hand pump adapted for pumping a liquid from a flexible container, said pump including an elongated, axially reciprocal plunger, a head mounted on the outermost end of said plunger having a normally depending skirt extending along the length of said plunger, a stationary collar including a normally upwardly extending enclosed wall portion, said wall portion being configured to telescopically receive said skirt upon depression of said plunger, with a vent opening remaining for passage of air between the skirt and wall portion, said vent opening forming a part of the air intake passageway for the pump, and means responsive to depression of said plunger for withdrawing a charge of said liquid from said container, the improvement which comprises:

flexible check valve means operatively disposed proximal to

said vent opening for preventing outward flow of said liquid through said air intake passageway as a consequence of depression of said plunger and incident deformation of said flexible container, and for allowing flow of air through said vent opening as needed,



said check valve means comprising an annular washer disposed about said plunger for abutting the underside of said skirt and slidably engaging the inner surface of said wall portion.

4,249,677

HAND HELD ELECTRIC CAULKING GUN

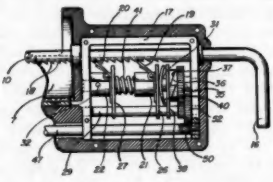
George B. Davis, Jr., 7512 Marbury Rd., Bethesda, Md. 20034

Continuation-in-part of Ser. No. 876,048, Feb. 8, 1978, Pat. No. 4,171,072. This application Apr. 3, 1979, Ser. No. 26,654

The portion of the term of this patent subsequent to Oct. 16, 1996, has been disclaimed.

Int. Cl.³ B67D *5/46*

U.S. Cl. 222—326 **18 Claims**



1. A hand held electric caulking gun including in combination, a receptacle for receiving therein a caulk containing cartridge having a caulk dispensing nozzle thereon, a piston movable when driven through said cartridge to force the caulking therein from said nozzle, a reciprocating surface, an electric motor, a speed reducing drive train connecting said motor with said reciprocating surface and operative when driven by said motor to cause reciprocal movement of said surface, a notched surface extending along a surface of said piston, a driving pawl yieldably engaging the notched surface of said piston and movable by reciprocal movement of said reciprocating surface to engage in driving relation the notched surface of said piston to drive said piston forwardly through said receptacle to force the caulking therein from said nozzle, a holding pawl maintained in yielding engagement with the notched surface upon said piston and operative to hold said piston in its forwardly driven position and resilient means operatively associated with said driving pawl to allow for stoppage of movement of said driving pawl should the reacting force against the caulk driving end of the piston exceed a predetermined value during operation of said motor.

4,249,678

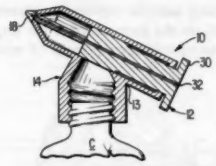
COMBINED CLOSURE AND DISPENSING CONTROL TOP FOR CONTAINERS

Jorge Pombo, Juan Leon Mera 1414 y Colon 1° ofic. A, Quito, Ecuador

Filed May 15, 1979, Ser. No. 39,291

Int. Cl.³ B65D *47/10*

U.S. Cl. 222—409 **6 Claims**



1. A combined closure and dispensing control top for closing containers and for controlling the rate of dispensing of the contents of the containers when inverted, the top comprising:

a housing defining a body member having a fore chamber connectable to the top of the container, an ejection chamber having an axis skew to an axis of the fore chamber, a passageway interconnecting the fore and ejection chambers, the ejection chamber having axially aligned front and rear openings; and

a closure and dispensing control member having a piston portion disposed for sliding movement within said ejection chamber, the piston portion having an axially extending exterior configuration substantially equal to an axially extending interior configuration of the ejection chamber in the vicinity of the passageway interconnecting the fore and ejection chambers so that the effective size of the passageway is determined by the position of the piston portion, the closure and dispensing control member including an intermediate portion extending from said piston portion through said front opening, a portion extending rearwardly from said piston portion through said rear opening and terminating in an enlarged end, and an enlarged portion connected by a reduced diameter portion to said intermediate portion outside of said body member, rearward movement of said closure and dispensing control member from an initial blocking position to a dispensing control position separating said enlarged portion from said intermediate portion, said closure and dispensing control member in said dispensing control position controlling the rate of dispensing of the contents of an inverted container,

said intermediate portion having an end blocking said front opening upon subsequent forward movement of said closure member.

4,249,679

SEALING CLOSURE FOR ASPHALT MIX STORAGE BIN OUTLET

Bruce A. Dillman, Chien, Wis., assignor to Bituma Stor, Inc., Marquette, Iowa

Filed Feb. 5, 1979, Ser. No. 9,290

Int. Cl.³ B67D *3/02*

U.S. Cl. 222—542 **2 Claims**

1. A sealing closure for a bottom outlet in a bin for storage of asphalt paving mix, said closure comprising:

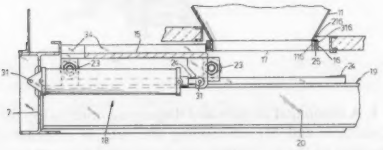
A. an annular rim member on the bin, surrounding said outlet, said rim member having coplanar downwardly facing radially inner and radially outer bottom surfaces extending therearound that are separated from one another by a downwardly opening groove extending around the rim member;

B. a gate member having a flat top surface engageable with said bottom surfaces on the rim member;

C. mounting means supporting the gate member with its top surface substantially parallel to the plane of said bottom surfaces on the rim member and for motion of the gate member in opposite closing and opening directions substantially parallel to its top surface, toward and from an open position in which the gate member is at one side of said outlet;

D. actuating means for moving the gate member in said directions;

E. cooperating motion translating means on the mounting means and on the gate member for imparting to the gate member an upward component of motion during a final



portion of movement of the gate member in its closing direction, to bring the gate member to a closed position in which it extends across the outlet and in which its top surface is urged towards firm engagement with said bottom surfaces on the rim member; and

F. means for forcing grease under pressure into said groove, at spaced locations around the groove, so that when the gate member is in its closed position the groove can distribute such grease all around the outlet and into any space between the top surface of the gate member and said bottom surfaces on the rim member, where the grease provides a seal around the outlet.

4,249,680

SECTOR SLIDING PLATE BRICK HAVING DISCHARGE PORTS AND AN IMPROVED SLIDING NOZZLE APPARATUS

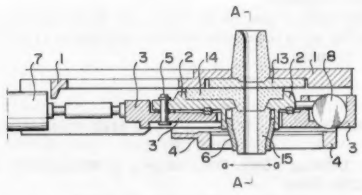
Morihiro Kimura, Tokyo; Kenji Yamamoto, Bizen, and Masahiko Nose, Waki, all of Japan, assignors to Shinagawa Refractories Co., Ltd., Tokyo, Japan

Filed Nov. 9, 1978, Ser. No. 959,168

Claims priority, application Japan, Nov. 28, 1977, 52-141681

Int. Cl.³ B22D *41/08*

U.S. Cl. 222—598 **4 Claims**



1. A sliding nozzle apparatus for casting molten metal comprising a sector-shaped sliding plate comprising a refractory material and having a plurality of discharge ports therethrough, the plane configuration of said plate having a sector-like shape, the center of each discharge port in said sector plate being located at a point corresponding to a definite distance from the common center of an arc passing through the center of each discharge port, means for rotating said plate about said common center, and means for moving said plate lengthwise for movement of a discharge port towards and away from said common center.

4,249,681

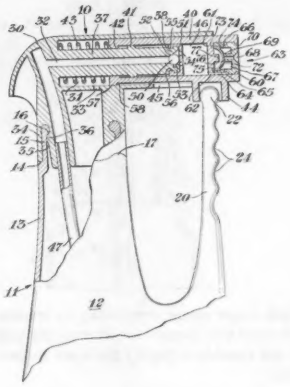
LEAK-PROOF SPRAYER

Floyd R. French, Manchester, Mo., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 11, 1979, Ser. No. 47,404

Int. Cl.³ F05B *11/00*

U.S. Cl. 222—380 **2 Claims**



1. In a manually operated dispensing pump adapted to be connected to a container for dispensing a liquid product therefrom, wherein the pump includes variable volume means defining a pump chamber, an inlet passageway providing communication between the pump chamber and a liquid reservoir in the container, an inlet check valve operatively disposed within the inlet passageway for permitting the flow of liquid only from the liquid reservoir to the pump chamber, discharge means defining a dispensing orifice, an outlet passageway providing communication between the dispensing orifice and the pump chamber, and an outlet check valve operatively disposed within the outlet passageway for permitting the flow of liquid only from the pump chamber to the dispensing orifice;

the improvement wherein the outlet check valve includes a resilient diaphragm operatively disposed within the outlet passageway adjacent to and convexed toward the dispensing orifice, the diaphragm being normally in tensioned engagement with the dispensing orifice and adapted to flex out of engagement therewith when the pressure within the pump chamber and the outlet passageway exceeds the engaging force of the diaphragm, whereby liquid is permitted to flow from the pump chamber through the dispensing orifice and into the atmosphere; and the discharge means and the diaphragm comprise an integrally molded dispenser insert wherein the diaphragm is joined to the discharge means by a flexible hinge and the diaphragm is pivoted about the hinge to engage the dispensing orifice.

4,249,682

SPARE WHEEL PROTECTING SYSTEM

Setsuo Yasue, Gifu, and Tomio Yamamoto, Aichi, both of Japan, assignors to Sankokiki Kabushiki Kaisha, Aichi, Japan

Filed Apr. 7, 1978, Ser. No. 894,378

Claims priority, application Japan, Sep. 24, 1977, 52/114936

Int. Cl.³ B62D *43/00*

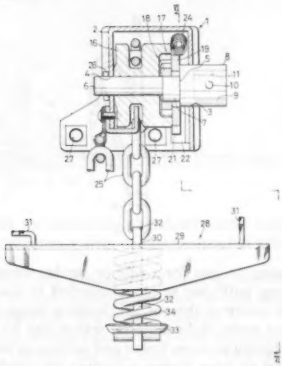
U.S. Cl. 224—42.23 **2 Claims**

1. A spare wheel protective system associated with a plurality of spare wheel holding devices, each holding a spare wheel under a motor vehicle chassis, to preclude operation and wheel removal by anyone other than the vehicle owner, each spare tire wheel holding device including a winch fixed on a driving shaft which may rotate in either direction for selective raising or lowering said spare wheel, and an operating handle having

a drive end connectable to one end of said driving shaft to transmit turning power thereto; said protective system comprising:

a recessed socket means and an interlocking axle means, one of said socket means or axle means being fixed on the end of the driving shaft, the other of said means comprising the drive end of said handle, said axle means being engageable with said socket means to transmit turning power thereto,

said socket means having at least two engaging means therein, said axle means having a corresponding number of engaging means thereon, each of which is complementary and adapted to mate with the corresponding engaging means in said socket means, the relative spatial relationship between each of the engaging means in the socket means, and the corresponding engaging means on the axle means, differing for each spare wheel holding device to preclude interconnection of any operating handle thereto,



other than one having the predetermined spatial relationship of the engaging means thereon, and

wherein both of said socket means and said interlocking axle means have two said engaging means, both of which on said socket means are protuberances, while both of said two engaging means on said interlocking axle means are recesses, wherein a first of said protuberances is a pin secured to said socket means and extending transversely therethrough, while a first of said recesses is formed in an end surface of said interlocking axle means transversely across said end surface to receive said pin, and wherein a second of said protuberances is an elongate protuberance formed on an inner wall of said socket means and extending along the longitudinal axis thereof, while a second of said recesses is a groove formed on the peripheral surface of said interlocking axle means and extending along the longitudinal axis thereof to receive said elongate protuberance.

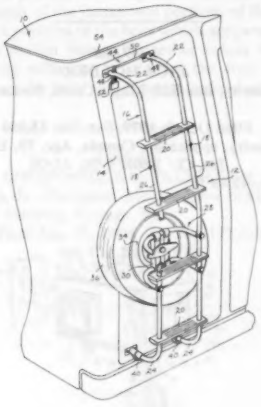
4,249,683

COMBINATION LADDER AND SPARE TIRE CARRIER

John R. Park, 25895 Miner Rd., Elkhart, Ind. 46514

Filed Jan. 14, 1980, Ser. No. 111,671
Int. Cl.[3] B60R *3/00;* **E06C** *5/02, 7/08*
U.S. Cl. 224—42.12 **2 Claims**

1. A combination ladder and spare tire carrier for a vehicle having a wall, said ladder comprising two generally parallel side pieces interconnected by a plurality of spaced apart steps, each side piece including an upper and a lower end portion and an interconnecting central portion, the upper and lower end portions of said ladder side pieces being correspondedly bent with the side pieces having generally C-shaped configurations, said carrier for the spare tire secured to said ladder and carried between said end portions and adjacent the central portion of the ladder side pieces, hinge means at the lower end portions of said ladder side pieces for connection to said vehicle wall, releasable securement means at the upper end portions of said ladder side pieces for connection to said vehicle wall wherein said ladder when connected to the vehicle wall with said



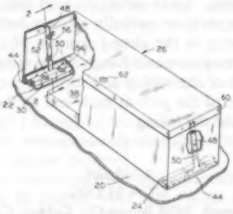
carrier positioned between said wall and ladder side piece central portions is pivotable from its stored generally vertical position about said hinge means into a lowered position exposing said carrier.

4,249,684

REMOVABLY ANCHORED BOX

Kenneth Miller, 7045 N. Kilpatrick, Lincolnwood, Ill. 60646, and Le Roy Dombeck, 2527 W. Shakespeare, Chicago, Ill. 60647

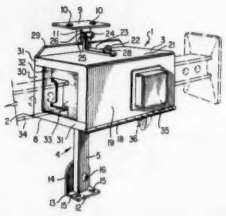
Filed Mar. 22, 1979, Ser. No. 22,932
Int. Cl.[3] B60R *9/00*
U.S. Cl. 224—42.4 **3 Claims**



1. A system for securing a box to a chassis comprising: a box having a lockable cover, side walls, and a bottom which is raised at least in part; at least two spaced parallel anchor rails affixed to said chassis to which said box may be locked, each of said anchor rails having at least one slot and a configuration which can be accommodated beneath said raised bottom portion of said box, thereby making the anchor rails inaccessible when the box is secured to the chassis; means for securing said anchor rails to said chassis; a pair of brackets, each secured to an interior side wall of said box; at least one locking rod associated with each of said brackets and vertically supported by said brackets, said rods having top and bottom angled portions, said top angled portion overlapping said bracket such that in the locked position only the tip of the angled portion contacts said bracket, said bottom angled portion capable of being inserted into said slot in said anchor rail and rotated underneath said anchor rail such that in the locked position only the tip contacts the anchor rail; a plurality of resilient mounts posi-

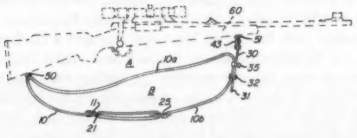
tioned between the bottom of said box and each of said anchor rails, whereby said resilient mounts assist in maintaining anchoring pressure between said box and said anchor rails and cushion said box against shocks when said box and chassis are transported.

4,249,685
JACK HOLDER
Kenneth J. Sawby, Box 520, Maple Creek, Saskatchewan, Canada
Filed Oct. 9, 1979, Ser. No. 83,064
Claims priority, application Canada, Apr. 19, 1979, 325867
Int. Cl.³ B60R *9/00, 11/06*
U.S. Cl. 224—42.45 R **2 Claims**



1. A jack holder for a jack of the type including post and lift elements movable along said post, said jack holder comprising a base section adapted to be mounted on the exterior wall of a motor vehicle for supporting the lift elements of the jack with the post therein; a cover section for covering the lift elements and a portion of the post of the jack; hinge means pivotally interconnecting said base and cover sections, and permitting movement of the cover section between an open position in which the jack can be placed on the base section, and a closed position in which the base and cover sections define an open-ended casing, with the cover section covering said lift elements and a portion of the post, with the post extending beyond the ends of said casing; flange means on each end of each of said base and cover sections partially closing both ends of said open-ended casing in the closed position of the casing; and flexible sealing means on said flange means closing the remainder of the ends of the casing and forming a continuous seal around the post of the jack at each end of the casing in the closed position of the casing.

4,249,686
GUN SLING
Burton S. Morwood, 2493 Braun Ct., Golden, Colo. 80401
Filed Oct. 29, 1979, Ser. No. 88,954
Int. Cl.³ F41C *33/00*
U.S. Cl. 224—150 **10 Claims**



1. A shoulder held weapon sling for carrying and very rapid shouldering of such weapon for firing, in combination with a shoulder weapon having a butt D-ring and a barrel forearm D-ring, comprising:

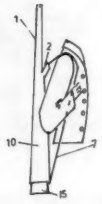
a. a first strap formed into an adjustable length loop for passing over a shoulder and torso of a user, and arranged to be secured to the butt D-ring of a weapon;

b. a short, second strap secured to the forearm D-ring on a weapon leaving a free end;

c. releasable means connecting said second strap to said loop of said first strap whereby the weapon may be carried hands-off across the user's chest, and said releasable means being rapidly releasable from said first strap by pulling the free end of said second strap; and

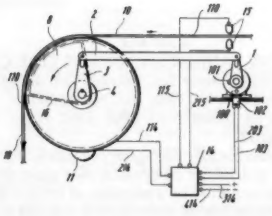
d. lock means for temporarily securing said second strap to said loop of said first strap.

4,249,687
WEAPON CASING
Jean Warnier, 19, Rue Laborde, Bron 69500, France
Filed Nov. 7, 1978, Ser. No. 958,375
Claims priority, application France, Nov. 7, 1977, 77 34361
Int. Cl.³ F41B *13/04*
U.S. Cl. 224—913 **4 Claims**



1. A housing or case for a rifle or similar weapon having a carrying strap with two sections attached to said weapon to facilitate the transport thereof, said housing being comprised of a supple and water tight material which can be folded, said housing including an open lower end portion in the form of an envelope and an open sleeve extending outwardly from said housing, a lining for said sleeve, a sleeve zipper for closing and sealing said sleeve around said strap, one of said attached strap sections comprising a lower strap attachment section connected to said rifle, said open lower end portion extending to said lower strap attachment section and having a zipper connected to said sleeve zipper.

4,249,688
DEVICE FOR INTERMITTENT FEEDING OF WEBS
Gerhard Klemm, Am Rehwinkel 37, 4800 Bielefeld 1, Fed. Rep. of Germany
Filed Mar. 19, 1979, Ser. No. 21,819
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1978, 2812099
Int. Cl.³ B65H *25/24, 17/28*
U.S. Cl. 226—24 **18 Claims**



10. A transport device for intermittently feeding a web, comprising a rotary hollow cylinder having a perforated cylindrical wall for supporting the web to be transported; a stationary suction member arranged in said cylinder in operative proximity to a portion of the cylindrical wall which is in

contact with said web; drive means for imparting an intermittent rotation to said cylinder and thus a predetermined forward movement to said web, said suction member including a suction segment having an orifice in contact with said portion of the inner surface of said cylindrical wall, a suction pipe communicating with said suction segment and projecting coaxially with the axis of rotation from said cylinder, and a suction pump connected to said suction pipe.

4,249,689

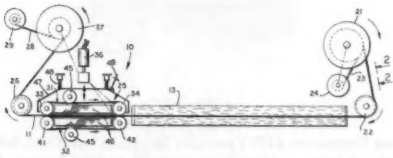
METHODS OF AND APPARATUS FOR ADVANCING ELONGATED MATERIAL

James E. Voytko, Doraville, Ga., assignor to Western Electric Company, Inc., New York, N.Y.

Continuation of Ser. No. 882,023, Feb. 28, 1978, abandoned. This application Feb. 21, 1980, Ser. No. 123,151

Int. Cl.³ B65H *17/34*

U.S. Cl. 226—172 **8 Claims**



2. A capstan for advancing an indeterminate length of material which comprises a strip of interconnected articles, which includes:

a first belt having a plurality of looping elements made of flexible, resilient material attached to and extending substantially normal to a surface thereof;

a second belt having a plurality of hooking elements made of flexible, resilient material attached to and extending substantially normal to a surface thereof and capable of interlocking with the looping elements of the first belt when said surfaces of said belts are pressed together with an elongated strip of articles therebetween and of becoming disengaged from the looping elements when the surfaces are peeled apart, said belts being sufficiently flexible so that when pressed together they are capable of conforming to and gripping the elongated strip material disposed therebetween, said hooking and looping elements extending from said respective surfaces a distance which is sufficient to become interlocked with said strip therebetween;

a first pair of spaced rollers for supporting said first belt;

a second pair of spaced rollers for supporting said second belt;

means for supporting said first pair of rollers;

means for supporting said second pair of rollers so that the portion of the second belt between said second pair of rollers is capable of being juxtaposed with the portion of the first belt between the first pair of rollers;

means for normally urging said portions of the paths of the first and second belts into juxtaposition with each other;

means for mounting said supporting means for at least said first pair of spaced rollers to permit said supporting means for said first pair of rollers to be moved in a direction away from said second pair of spaced rollers to permit the strip to be positioned between said belts;

means for moving said means for mounting said supporting means for said first pair of spaced rollers in a direction away from said supporting means for said second belt to permit the strip to be positioned therebetween and subsequent to the positioning of the strip between said belts for moving said supporting means for said first belt toward said supporting means for said second belt; and

means for moving the belts in opposite rotary directions along paths with a portion of the paths being along the juxtaposed portions of the belts to cause successive corresponding portions of the belts to be moved into pressed engagement with each other to grip a strip disposed therebetween with the hooking and looping elements extending through openings between the articles of the strip, to be moved fastened together in the same direction along the juxtaposed portions of the paths, and then to be peeled apart at ends of the juxtaposed portions of the paths, said successive portions of the belts which are pressed together and then moved fastened together before being peeled apart being sufficient to advance the strip in the same direction as the belts along the juxtaposed portions of the paths.

4,249,690

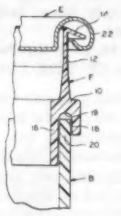
COMPOSITE GAS FLUSH CAN

Louis E. Held, Jr., Florissant, Mo., assignor to Container Corporation of America, Chicago, Ill.

Filed Jan. 31, 1980, Ser. No. 117,382

Int. Cl.³ B65D *5/64*

U.S. Cl. 229—5.5 **1 Claim**



1. A composite can, adapted for gas flushing the contents thereof, comprising:

(a) a tubular body open at the ends thereof and formed primarily of paperboard;

(b) one closure member secured to one end of said body;

(c) a generally cylindrical flange structure secured to the other end of said can body;

(d) said flange structure including:

(i) a pair of radially spaced inner and outer walls defining therebetween an annular groove within which is secured said other can body end;

(ii) a relatively thin skirt formed integrally with and extending upwardly from the juncture of said inner and outer walls;

(iii) said skirt having an integrally formed rim projecting upwardly and outwardly therefrom for attachment to another closure member;

(e) said other closure member being partially crimped so as initially to fit loosely over said flange and said rim to provide passage for flushing gas;

(f) said other closure member being subsequently secured to said flange and said rim at the conclusion of the flushing operation.

4,249,691

PARTITION STRUCTURE

Jeffrey M. Gardner, Wheaton, Ill., assignor to Container Corporation of America, Chicago, Ill.

Filed Mar. 18, 1980, Ser. No. 131,440

Int. Cl.³ B65D *5/48*

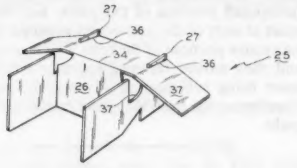
U.S. Cl. 229—15 **5 Claims**

1. A partition structure formed from a unitary blank of paperboard for dividing an outer container into a plurality of cells, comprising:

(a) a vertical longitudinally extending partition element;

(b) transverse partition elements foldably connected to said longitudinally extending partition elements along a gusset formed between said longitudinal partition element and each of said transverse partition elements;

(c) a locking panel foldable with respect to said longitudinally extending partition element into locking engagement



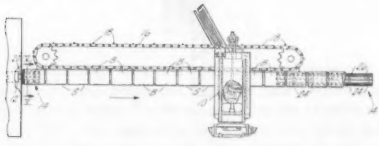
with said transverse partition elements and against said longitudinally extending partition to define a plurality of cells.

4,249,692

HORN FOR CAN BODY SOLDERING

Frederick S. Sillars, Beverly, Mass., assignor to USM Corporation, Farmington, Conn.

Filed Jun. 16, 1978, Ser. No. 916,201
Int. Cl.³ B23K *37/00*
U.S. Cl. 228—15.1 **12 Claims**



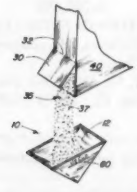
1. In a machine for side-seam soldering can bodies and comprising power means for successively feeding the bodies from a body forming horn in generally coaxial arrangement to a molten solder applicator, the improvement which comprises: an elongated stub horn mounted on the forming horn and extending therefrom adjacent to the feed means at least to the applicator, said stub horn being dimensioned so as to gradually deform the can bodies from a generally circular cross-section to an ellipsoidal cross-section and frictionally engage the inside walls of the cans as they are conveyed, said stub horn also having a substantially continuous longitudinally grooved formation disposed for slidably interfitting with and guiding the joints of the successive body side seams on the can inside walls thus to define the path of the seams with respect to the molten solder to be applied thereto by said applicator.

4,249,693

CARDBOARD CONTAINER COVER

Michael Diaz, 6704 Sycamore #2, New Orleans, La. 70127

Filed Oct. 17, 1979, Ser. No. 85,464
Int. Cl.³ B65D *17/16, 43/04*
U.S. Cl. 229—43 **7 Claims**



1. A removable dispensing container-box closure apparatus comprising:

a. a pair of rectangular planar members joining at a common edge, each of said members having uniformed widths corresponding to the width of said common edge, said planar members forming an angle with respect to each other of substantially ninety degrees (90°); and

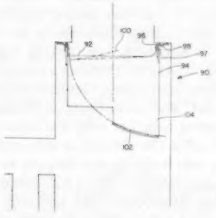
b. a pair of corresponding side webb members each having at least three edges and each side webb member integrally connecting at at least two of said edges to said pair of planar members, the integral connection of said side webb members and said planar rectangular members providing a container having an inner container space and providing an opening for receiving a dispensed product into said inner container space, said webb members being inwardly biased toward each other to provide gripping means for attaching said apparatus to a box to be covered, said apparatus being freely removable from any product dispensing box with which it is being used.

4,249,694

DRAFT CONTROL ARRANGEMENT

Werner Diermayer, 1275 Panorama Dr., Lafayette, Calif. 94549; Luitpold Kutzner, Marschnerstrasse 78, D-8000 Munich, Fed. Rep. of Germany, and Erwin Postenreider, Postfach 240, D-8031Groebenzell, Fed. Rep. of Germany

Division of Ser. No. 831,547, Sep. 8, 1977, abandoned. This application Apr. 9, 1979, Ser. No. 28,369
Int. Cl.³ G05D *23/08*
U.S. Cl. 236—1 G **5 Claims**



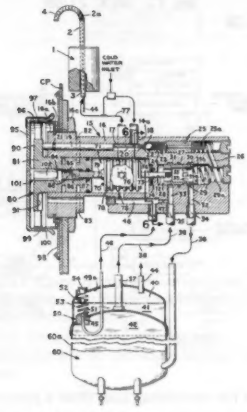
1. In a gas-fired heating apparatus having a draft hood for directing a flow of waste gas to a vent, a throttling device comprising the combination of main flow control means for sensing temperature of the gas and responding to said temperature for reducing or enlarging the cross-sectional throttle area for directing gas to the vent, said main flow control means including bimetal element means shaped to project across said throttle area and changing shape responsive to temperature change for reducing or enlarging the throttle area, secondary control means for causing the rate of throttle area change for unit change in temperature during one phase of operation to vary from the rate of throttle area change for unit change in temperature during another phase, and in which the bimetal element means is formed with a distal end margin which is caused to move along a path across the conduit during a change in shape of the bimetal element, and said secondary control means includes baffle means disposed generally laterally across the conduit along the path of movement of the distal end of the bimetal element, said baffle means cooperating with the end margin of the bimetal element for causing the effective throttle area to remain substantially constant during a portion of movement of the end margin which is adjacent to the baffle means.

4,249,695

THERMALLY ACTUATED MODULATING VALVE, AND ASSEMBLIES AND SYSTEMS UTILIZING THE SAME FOR PROVIDING TEMPERATURE CONTROLLED HEATED WATER

Richard C. Dreibelbis, Fair Lawn, N.J., assignor to Emerson Electric Co. (H & H Prod. Div), Cedar Grove, N.J.

Filed Dec. 12, 1979, Ser. No. 102,772
Int. Cl.³ G05D *23/13*
U.S. Cl. 236—12 L **37 Claims**



13. In a thermally actuated modulating valve assembly,

a. valve body means having an inlet means for providing the total volume of cold source water delivered to the modulating valve, and an outlet means for a heated water mixture,

b. said valve body means having a bore at one end defining a transfer chamber connected to said outlet means for delivering the heated water mixture thereto,

c. a proportioning assembly formed at the other end of said valve body means including,

1. a proportioning chamber having an inlet connected to said inlet means to receive the cold source water,

2. space outlet means disposed for communication with said proportioning chamber, and

3. slide valve means to vary the volume of cold source water delivered to at least one of said spaced outlets,

d. heating and storage means connected to said at least one spaced outlet means to receive the varying volumes of cold source water therefrom and adapted to displace corresponding varying volumes of heated water from said heating and storage means,

e. said valve body means having a mixing space connected to receive cold source water directly from another of said spaced outlet means and heated water from said heating storage means, and said mixing space connected to deliver the heated water mixture to said transfer chamber,

f. a thermally actuated power element mounted in the bore in said valve body means and disposed in the transfer chamber for actuation by variations in temperature of the heated water passing therethrough,

g. said thermally actuated power element operatively connected to said slide valve means for moving the same in accordance with the variations in the temperature of said heated water passing through said transfer chamber, and

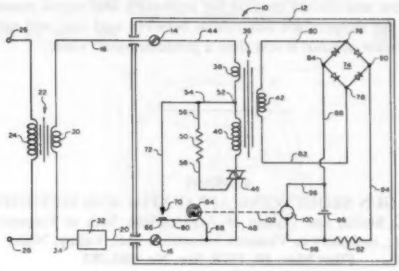
h. a temperature setting assembly for setting the temperature of the heated water mixture to be delivered from the outlet means of said thermally actuated modulating valve assembly.

4,249,696

CHARGING CIRCUIT FOR BATTERY IN THERMOSTAT WITH BATTERY OPERATED TIMER

Donald E. Donnelly, Edwardsville, and Robert C. Krump, Waterloo, both of Ill., assignors to Emerson Electric Co., St. Louis, Mo.

Filed May 11, 1979, Ser. No. 38,093
Int. Cl.³ F23N *5/20*; H02J *7/00*
U.S. Cl. 236—46 R **2 Claims**



1. An improved battery charging circuit means in a timer controlled space thermostat wherein the timer is connected to a rechargeable battery for continuous operation thereof, wherein the improved charging circuit means comprises:

a transformer including two primary windings and one secondary winding wound on a single iron core;

said secondary winding being connected in circuit with the battery for effecting charging of said battery when energized;

one of said primary windings being of low impedance and connected in series with a thermostat switch of the space thermostat and energized when said thermostat switch is closed to effect energizing of said secondary winding;

the other of said primary windings being of high impedance and connected in parallel with said thermostat switch and energized when said thermostat switch is open to effect energizing of said secondary winding;

controlled solid state switching means connected in series with said other of said primary windings; and

gating circuit means for said switching means connected in parallel with said thermostat switch;

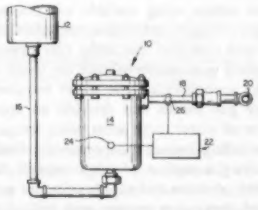
said gating circuit means being energized to effect conduction of said switching means only when said thermostat switch is open.

4,249,697

STEAM TRAP MONITOR

Harlow D. Savage, Jr., 1224 Farmington Ave., West Hartford, Conn. 06107

Filed Jun. 25, 1979, Ser. No. 51,734
Int. Cl.³ G05D *23/00*
U.S. Cl. 236—94 **13 Claims**



1. In a steam generating system having a steam trap, a con-

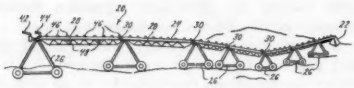
densate conduit connected in fluid transfer relation to said trap, and a device for monitoring operation of said trap, the improvement comprising said monitoring device having first thermally responsive means disposed in heat transfer relation to said trap for generating a first output indicative of the temperature of said trap, second thermally responsive means disposed in heat transfer relation to said condensate conduit for generating a second output indicative of the temperature of said condensate conduit, signal means, and means responsive to said first and second outputs for activating said signal means when the temperature differential between said trap and said condensate conduit is less than a predetermined value.

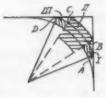
4,249,698

END GUN SEQUENCING APPARATUS AND METHOD

Neil C. Smith, and Donald H. Scrutchfield, both of Fremont, Nebr., assignors to Valmont Industries, Inc., Valley, Nebr.

Filed Mar. 10, 1978, Ser. No. 885,382
Int. Cl.[3] B05B 3/00
U.S. Cl. 239—1 **13 Claims**





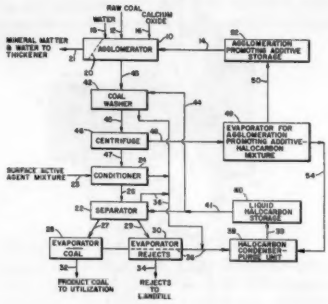
1. In an irrigation system having an elongated conduit assembly with an inner end pivotally connected to the water source at a central pivot point and having a plurality of discharge nozzles at spaced intervals along its length, drive means for moving the conduit assembly around the pivot point to irrigate a primary field area of approximately circular configuration, a first short range spray gun means and a second long range spray gun means secured substantially near the outer end of the conduit for irrigating a secondary field area beyond the periphery of the primary field area, the improvement comprising sequencing means to control the operation of the irrigation system to provide the same watering pattern for each complete revolution of the conduit wherein either the first or second spray gun means is operating whenever the conduit is in a primary field area adjacent a secondary field area, said second spray gun means being capable of spraying a substantially greater rate of water and with a range further into the secondary field area than said first spray gun means, said sequencing means including means to balance the water distribution in the conduit to accommodate the water requirements of each of said spray gun means and provide an approximately equal application of water to all areas being irrigated, the balancing means including means to operatively disable the discharge nozzles along a section of main conduit to proportionately increase the pressure and supply of water available to operate the second spray gun means, said second spray gun means irrigating that portion of primary field area otherwise irrigated by the disabled discharge nozzles.

4,249,699

COAL RECOVERY PROCESSES UTILIZING AGGLOMERATION AND DENSITY DIFFERENTIAL SEPARATIONS

Clay D. Smith, and Douglas V. Keller, Jr., both of Lafayette, N.Y., assignors to Otisca Industries, Ltd., Syracuse, N.Y.

Continuation-in-part of Ser. No. 91,129, Nov. 5, 1979, which is a continuation-in-part of Ser. No. 561,168, Mar. 24, 1975, Pat. No. 4,173,530, which is a continuation-in-part of Ser. No. 423,577, Jan. 14, 1974, abandoned. This application Dec. 4, 1979, Ser. No. 100,091
Int. Cl.[3] B02C 23/08
U.S. Cl. 241—20 **18 Claims**



1. A process for recovering coal from a particulate composite in which said coal is associated with mineral matter, said process comprising the steps of: agitating the particles of said composite in a slurry in an aqueous carrier containing an agglomeration promoting additive with respect to which the coal is hydrophobic to effect a separation of the coal particles from the mineral matter, a coalescence of said particles into agglomerates, and the ejection of mineral matter into dispersion in said aqueous carrier; recovering said agglomerates from said aqueous carrier; effecting a resolution of said agglomerates into the particles into which they are composed; and subjecting said particles to density differential separation in a body of parting liquid, whereby those particles which have a relatively high concentration of mineral matter will migrate to the bottom of said body of parting liquid and those particles contain a lower proportion of mineral matter and a high proportion of coal will rise to the top of said body of parting liquid; and thereafter separately recovering the floats and the sinks from said body of parting liquid.

4,249,700

RECOVERY OF SILICON CARBIDE WHISKERS FROM COKED, CONVERTED RICE HULLS BY LIQUID-LIQUID SEPARATION

Bhupendra K. Parekh, and William M. Goldberger, both of Columbus, Ohio, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jul. 2, 1979, Ser. No. 53,738
Int. Cl.[3] B02C 23/00
U.S. Cl. 241—24 **11 Claims**

1. A method for separating silicon carbide whiskers from a mixture of silicon carbide whiskers with carbonaceous silicon carbide particles, comprising:

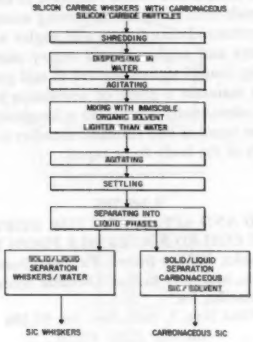
(i) shredding the mixture down to a specified particle size in order to liberate the silicon carbide whiskers from the carbonaceous silicon carbide particles;

(ii) dispersing the shredded mixture in water to form an aqueous mixture of hydrophilic silicon carbide whiskers and hydrophobic carbonaceous silicon carbide particles;

(iii) agitating the aqueous mixture to further liberate said

hydrophilic silicon carbide whiskers from said hydrophobic carbonaceous silicon carbide particles;

(iv) mixing the aqueous mixture with an immiscible organic solvent which is lighter than water and which will have an affinity for said hydrophobic carbonaceous silicon carbide particles;



(v) agitating the aqueous mixture and organic solvent;

(vi) settling the aqueous mixture and organic solvent so as to establish two liquid phases;

(vii) separating the two liquid phases; and,

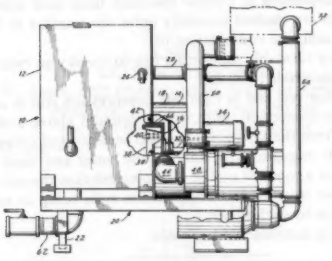
(viii) separating the silicon carbide whiskers from the aqueous mixture.

4,249,701

WASTE PULPING APPARATUS

Blaine M. Miller, Jr., Malvern, Pa., assignor to Somat Corporation, Pomeroy, Pa.

Filed May 16, 1979, Ser. No. 39,643
Int. Cl.³ B02C *13/286*
U.S. Cl. 241—46.17 **14 Claims**



1. An apparatus for pulping waste comprising:

a pulping tank adapted for holding a quantity of water and waste material and having an opening in a wall thereof;

an impeller extending across the opening in the tank and adapted for rotational movement to reduce water and waste material from said tank to a slurry;

a slurry chamber having substantially cylindrical side walls positioned behind the impeller and separated from the tank by said impeller and a sieve, the sieve allowing water and waste material reduced to a slurry by said impeller to enter the slurry chamber, the slurry within said slurry chamber capable of rotational movement when the impeller rotates;

a discharge opening within the slurry chamber through which the slurry may be removed and having an upstream and a downstream side relative to the direction of flow in said slurry chamber; and

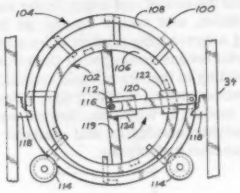
liquid deflecting means mounted within said slurry chamber adjacent the downstream side of the discharge opening and adapted for deflecting the slurry towards the discharge opening to increase throughput and pulping efficiency.

4,249,702

PRODUCE STALK CUTTER

Charles E. Miller, 974 Mader St. SE., Salem, Oreg. 97302

Filed Apr. 25, 1979, Ser. No. 33,141
Int. Cl.³ B02C *18/26*
U.S. Cl. 241—205 **10 Claims**



1. Apparatus for cutting clustered produce stalks comprising

means defining a revolvable produce-receiving chamber having a wall including blade-receiving apertures,

a blade carrier mounted outside of said wall for revolution therewith about an axis offset with respect to the revolution axis of said chamber-defining means,

for each of said apertures, an elongate blade mounted on said blade carrier extending substantially radially through the aperture into said chamber, and

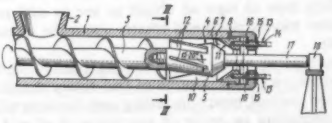
means operatively interconnecting said carrier and said chamber-defining means for producing, in response to revolution of one of said carrier and chamber-defining means, related revolution of the other, with such producing generally radially directed, recurrent reciprocation of each blade relative to its associated aperture.

4,249,703

APPARATUS FOR MECHANICAL AND CHEMICAL DESTRUCTION OF POLYSACCHARIDES OF YOUNGER SLIGHTLY DECOMPOSED PEAT

Vladimir P. Korenev, ulitsa Akademika Kurchatova, 13, kv. 59, Irkutsk; Jury S. Ippolitov, ulitsa Lapina, 9, kv. 10, Irkutsk; Boris P. Belyaev, ulitsa Lapina, 9, kv. 6, Irkutsk; Arvid Y. Kalninsh, ulitsa Sverdlova, 8, kv. 3, Riga; Nikolai A. Vedernikov, ulitsa Aptiekas, 8, kv. 66, Riga; Valter P. Krastinsh, ulitsa Sabiles, 11, kv. 12, Riga; Guntis K. Abolinsh, poselok Salaspils, ulitsa Miera, 16/7, Rizhsky raion; Karl M. Abele, ulitsa Michurina, 22, kv. 12, Riga, and Felix A. Ekis, ulitsa Suvorova, 131, kv. 4, Riga, all of U.S.S.R.

Continuation of Ser. No. 806,553, Jun. 14, 1977, abandoned.
This application Nov. 16, 1978, Ser. No. 961,103
Int. Cl.³ B02C *7/14*
U.S. Cl. 241—247 **4 Claims**



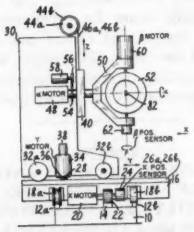
1. Apparatus for mechanical and chemical destruction of polysaccharides of younger slightly decomposed peat comprising, a tubular casing of constant inner diameter, a driven auger feeder in said casing for conveying starting material axially along the casing, means defining an inlet for introducing starting material into said casing, a nozzle having a central passage

in communication with said casing and defining an outlet from said tubular casing axially spaced from said inlet, a working head on an end of said auger feeder and rotationally driven thereby, said working head comprising two frustoconical cones connected along larger bases thereof, a first of said frusto-conical cones having a taper and progressively increasing in diameter in a direction of material flow in said casing toward said outlet and defining with inner cylindrical surfaces of constant diameter of the tubular casing a working annular space gradually decreasing axially in cross section within which material being treated in said casing is progressively compressed, mixed and treated, a second of said frusto-conical cones having a shorter axial length than said first cone and tapering toward the axis of said auger feeder and in a direction toward said outlet, said nozzle having an internal tapered passage having a converging portion at least partially circumferentially of said second cone spaced therefrom and having a taper corresponding to the taper of said second cone and defining with said second cone a working zone a desired volume of uniform cross section in which mechanical and chemical destruction of polysaccharides in said material takes place to yield a homogeneous hydrolysate.

4,249,704
AUTOMATIC TAPING APPARATUS

Yoshikazu Sakaue, and Hisaichi Maruyama, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 5, 1979, Ser. No. 17,327
Claims priority, application Japan, Apr. 25, 1978, 53-49525; Jul. 19, 1978, 53-88584
Int. Cl.³ B65H *81/08*
U.S. Cl. 242—7.23 **9 Claims**



1. An automatic taping apparatus, comprising:

a rotatable member movable, in operation, along the length of an object to be taped and rotatable about the object to be taped;

means mounting said rotatable member for movement along the length of an object to be taped and for rotation about the object to be taped and for rotation about two orthogonal radial axes of said rotatable member;

position sensing means for sensing the position and rotation angles of said rotatable member and for generating position and angle signals representative thereof;

tape feed means on said rotatable member for feeding a winding tape to tape an object in use as said rotatable member travels along and rotates about the object to be taped;

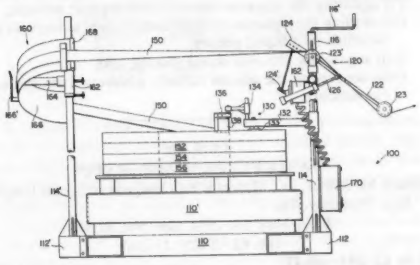
position control means responsive to control signals for controlling a spatial position of said rotary member, said position control means including angular control means for controlling an angle of revolution θ of said rotary member and for controlling respective angles of rotation α and β about the two orthogonal radial axes of said rotary member;

a computer, said computer including memory means for preliminarily storing shape data of a body to be taped in the format of a multiplicity of sets of coordinates $\{X_1,Y_1,Z_1), (X_2,Y_2,Z_2). \ldots, (X_n,Y_n,Z_n)\}$ referring to a three-dimensional orthogonal coordinate system, means for reading successive coordinates of said stored set of coordinates and for calculating command coordinates (X_m,Y_m,Z_m) and command angles ($^{\alpha}$m, $^{\beta}$m and $^{\theta}$m) to which said rotatable member is moved during a unit of time, and comparator means receptive of the position and angle signals from said position sensing means for comparing the command coordinates and angles with the actual coordinates and angles of said rotary member and for generating control signals applied to said position control means to maintain a plane of revolution of said rotary member substantially normal to a longitudinal axis of a body to be taped as said rotatable member is moved along the length of the body to be taped.

4,249,705
METHOD AND APPARATUS FOR DISPENSING FLEXIBLE COILED MATERIALS FROM PALLETS

Dannie L. Brooks, Willow Street, Pa., and Ronald S. Fields, Manakin, Va., assignors to Reel-O-Matic Systems, Incorporated, Wrightsville, Pa.

Filed Nov. 7, 1979, Ser. No. 92,104
Int. Cl.³ B21C *47/16*
U.S. Cl. 242—78.6 **14 Claims**



1. In the dispensing of flexible materials from coils wherein multiple coils are stacked coaxially upon one another to form an enlarged coil, the combination of:

(A) a rotary turntable supporting eye to the sky an enlarged coil of materials thereon;

(B) a snubber roll and at least one compression roll in coactive interconnection, each being mounted above and detached from the turntable, the said snubber and compression rolls engaging respectively the outer and inner periphery of a topmost coil in clamping relation thereto, the respective snubber and compression rolls being in radial opposition to each other;

(C) means to activate the turntable.

4,249,706
OPEN FACE SPINNING REEL

Gene R. Haselbauer, 10907 NE. 8 Ave., Biscayne Park, Fla. 33161, and Bert Freeman, 96 W. Grant Ct., Highland, Mich. 48031

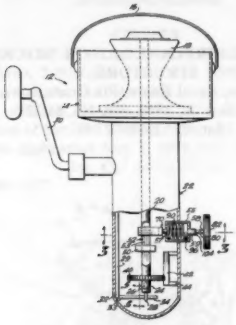
Filed Jan. 23, 1979, Ser. No. 6,259
Int. Cl.³ A01K *89/01*
U.S. Cl. 242—84.21 R **7 Claims**

1. An improved open face spinning reel comprising:

a spinning reel having a head portion including an interior spanned by a winding means and an exterior including drive means and a housing portion defining a housing,

a shaft reciprocally mounted in said portions and said drive means being adapted to rotate said winding means and reciprocate the shaft, the shaft including a lower end having a swivel whereby when the drive means turns the spool the shaft reciprocates allowing a line to be evenly distributed on said spool, and

means on the housing for locking and preventing rotation of the shaft comprising a locking member having a first end, the first end including a first and second zone, said first zone comprising a locking zone and a second zone comprising an open zone, whereby the shaft will not turn in the first zone but will freely turn in the second zone, the



locking member having a second end including an operator for engaging and disengaging the first and second first zones and the locking means having a middle portion fixedly mounted to the housing and including spring means normally urging the first end into a locked position with the shaft for preventing rotation therewith.

4,249,707

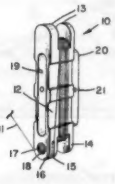
LEADER DISPENSER

Cyril W. Jones, 3725 Chinden Blvd., Boise, Id. 83704

Filed Feb. 11, 1980, Ser. No. 120,730

Int. Cl.³ B75H *75/36;* **A01K** *97/06*

U.S. Cl. 242—85.1 **5 Claims**



1. An improved leader dispenser for storing and dispensing leader material comprising:

a. leader receiving means for receiving the leader material which is wound onto said leader receiving means;

b. securing means for securing one of the ends of the leader material mechanically coupled to said leader receiving means; and

c. coupling means for coupling said improved leader dispenser to any one of a plurality of other identical said improved leader dispensers.

4,249,708

EMERGENCY LOCKING MECHANISM FOR THE SEAT BELT RETRACTOR OF VEHICLES

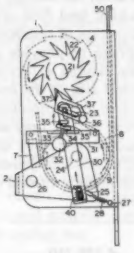
Shuichi Asano, Kawasaki, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 17, 1979, Ser. No. 76,333

Claims priority, application Japan, Sep. 29, 1978, 53-120674; Apr. 18, 1979, 54-48338

Int. Cl.³ A62B *35/02;* **B65H** *75/48*

U.S. Cl. 242—107.2 **13 Claims**



3. An emergency locking mechanism for a seat belt retractor in a vehicle, comprising:

a take-up spool biased in a direction winding said seat belt therearound,

brake means for inhibiting withdrawal of the seat belt from said take-up spool,

means for gripping said seat belt upon actuation of said brake means,

inertia sensitive means sensing emergency of the vehicle, and

transmission means operatively associated with said inertia sensitive means for actuating said brake means and said gripping means.

4,249,709

MECHANISM FOR THE AUTOMATIC SPOOLING OF SAFETY BELTS

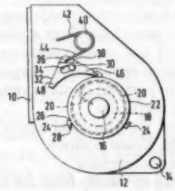
Uwe Otzen, Rottweil, and Peter Grüner, Schramberg, both of Fed. Rep. of Germany, assignors to Hugo, Kern & Liebers & Company, Schramberg, Fed. Rep. of Germany

Filed May 16, 1979, Ser. No. 39,692

Claims priority, application Fed. Rep. of Germany, May 17, 1978, 2821491

Int. Cl.³ A62B *35/00;* **B65H** *75/48*

U.S. Cl. 242—107.3 **8 Claims**



1. In an improved apparatus for the automatic respooling of safety belts, said apparatus including a belt spindle having seat belt wound thereon, said belt spindle rotatable in a housing including a roll-up spring engaging the belt spindle and being tensioned upon belt extension, and a friction brake for reducing the belt pull back forces; said friction brake including a first friction element connected to the belt spindle and a second friction element rotatably mounted and continuously in frictional engagement with the first friction element the improvement comprising an automatically-functioning two-arm stop

lever having a slot which is disposed about a pivot pin attached to said housing and said lever is pivoted on said pin and movable along said slot; a spring in biasing engagement with said two-arm lever such that the pointof contact of the spring with the lever moves from one side of the pivot pin to the other upon sliding of said lever from one side of the slot to the other thereby selectively engaging one of the two arms of said lever with the circumference of the second friction element, and at least one cam, provided on the circumference of the second friction element, said cam having a first portion engageable with the first arm of said lever for moving the lever to one side of said slot and interlocking said first arm with said second friction element in the direction of respooling said belt thereby actuating said friction brake to provide a reduced belt pull back force; and said cam having a second portion which is engageable with the second arm of the lever upon rotation of the second friction element in a direction of belt extension thereby moving said lever to the opposite side of said slot whereby the first arm becomes biased by said spring against the circumference of the second friction element in preparation for engagement with the first portion of said cam during a subsequent respooling of said belt.

4,249,710

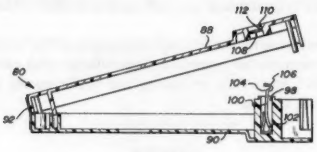
RELOADABLE CASSETTE

Fred J. Dobbs; Marshall W. Taylor, both of Duncanville, and Rinda S. Gulley, Carrolton, all of Tex., assignors to Dobbs-Stanford, Irving, Tex.

Continuation of Ser. No. 948,015, Oct. 2, 1978, abandoned. This application Mar. 19, 1980, Ser. No. 131,858

Int. Cl.³ G03B *1/04;* G11B *15/32*

U.S. Cl. 242—199 **12 Claims**



1. A reloadable cassette for magnetic tape carried on two reels, comprising:

an upper cassette portion having an outer edge and interior and exterior sides;

a lower cassette portion dimensioned to mate with said upper cassette portion and having an outer edge and interior and exterior sides;

a hinge attached between the outer edges of said upper and lower cassette portions;

said upper and lower cassette portions being pivotal about said hinge for movement from a closed position with the interior sides of said cassette portions in an adjacent facing relationship to an open position exposing the interior sides of said cassette portions to allow removal of the magnetic tape and two reels; and

catch means for securing said upper and lower cassette portions in the closed position;

said catch means comprising:

a sleeve extending upwardly from the lower cassette portion in a direction towards the upper cassette portion;

a metal elongate projection having a lower portion forceably inserted into said sleeve for frictional engagement therewith;

a clasp portion formed adjacent the top of said projection;

an inclined portion formed on the top of said projection above said clasp portion;

an aperture formed in the upper cassette portion for receiving said inclined portion, said clasp portion and said projection;

said inclined portion being operable to engage said aperture to align said clasp portion and projection with said aperture when said upper and lower cassette portions are moved from the open position to the closed position;

a catch surface formed within said aperture for engaging said clasp portion to secure said upper and lower cassette portions in the closed position.

4,249,711

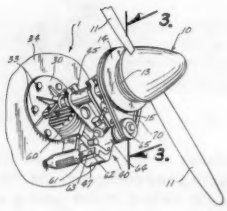
MINIATURE AIRPLANE MOTOR MOUNTING STRUCTURE

Byron L. Godbersen, Rural Route, Ida Grove, Iowa 51445

Filed Jun. 25, 1979, Ser. No. 51,721

Int. Cl.³ B64D *27/00*

U.S. Cl. 244—54 **4 Claims**



1. An adjustable model airplane engine mounting assembly for a model airplane, comprising:

a propeller assembly rotatably mounted on one end of an elongated shaft;

a mounting element secured to the other end of the elongated shaft, said mounting element frictionally engaging the elongated shaft to hold the elongated shaft rigidly to said model airplane; and

a model airplane engine attached to a support bracket which is suspended from and rotatable about the elongated shaft.

4,249,712

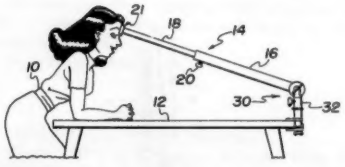
ADJUSTABLE HEADREST

Harold D. DeLong, 1483 Manzanita Ave., Escondido, Calif. 92027

Filed Apr. 2, 1979, Ser. No. 25,998

Int. Cl.³ B68G *5/00*

U.S. Cl. 248—118 **1 Claim**



1. An elongated headrest comprising:

(a) a base having a releasable clamp for attachment to the far edge of a horizontal table;

(b) an upright cylindrical stud extending from said base;

(c) a vertical bore defined in said boom receiving said stud;

(d) a clutch comprising an insert having a wedge-shaped opening engaged over said stud and a pressure-applying member fixed in said boom adjacent said bore to wedge said insert against said stud;

(e) said boom defining a short, vertical segment and elongated straight cantilevered segment, said vertical segment defining said bore in its bottom and having an adjustable locking joint at its top connecting two segments together;

(f) said upper cantilevered segment being defined in two locking telescoping components; and

(g) a forehead cradle mounted on the distal end of said cantilevered boom segment, whereby said headrest is universally adjustable azimuthally, elevationally, and longitudinally, and minimizes stress on said table by virtue of the low-torque attachment to the edge thereof.

4,249,713

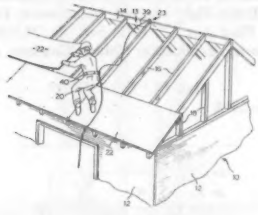
ROOF ATTACHMENT MEMBER FOR SAFETY LINES

John H. Glynn, 7 Richgrove Dr., Apt. 1006, Weston, Ontario M9R 2L1, Canada, and Patrick J. Glynn, 307 The Kingsway, Apt. C2, Islington, Ontario, M9A 3V3, Canada

Continuation of Ser. No. 890,616, Mar. 20, 1978, abandoned. This application Aug. 2, 1979, Ser. No. 63,120

Int. Cl.[3] **A47G** *29/02*

U.S. Cl. 248—237 **3 Claims**



1. For use with a clip connected to a safety line for roof workers, the clip including a hook portion having a leading point with a flattened transverse section, said section having a minimum dimension and having a maximum dimension transverse to the general plane of the hook portion:

an attachment member for roof peaks to which the safety line can be clipped, comprising a strip of metal bent to define an upstanding central portion consisting of two panels of the metal integral through a 180° bend at the top, each panel being integral at its bottom with an outwardly extending leg portion having means to allow attachment to structural roof members, the metal being such as to allow deformation without rupture, the central portion having an aperture for the insertion of the hook portion of said clip, the aperture being elongated in the direction parallel with the said 180° bend, and having a length greater than said maximum dimension and a width between said maximum and minimum dimensions, whereby the clip once inserted in the aperture cannot be rotated beyond a limited arc.

4,249,714

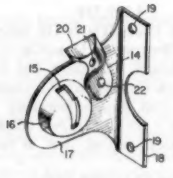
ROLLER SHADE BRACKET FOR REVERSIBLE SHADES

Carol J. Boyle, 1534 Avocado Ave., Melbourne, Fla. 32935

Filed Jun. 26, 1979, Ser. No. 52,245

Int. Cl.[3] **A47H** *1/10*

U.S. Cl. 248—267 **5 Claims**



1. A roller shade support bracket, comprising:

a support arm;

a slot formed in said support arm and dimensioned to receive a roller shade spring bar and support said roller shade spring bar in a position where the axial center of said bar is in the longitudinal center of said support arm, said slot including a flat bottom, a first side forming an angle with said flat bottom of greater than 90° and a second side forming an angle of 90° with said bottom, said second side including a bottom segment dimensioned to receive said roller shade spring bar and an upper segment projecting toward but not touching said first side for locking said roller shade spring bar in said slot;

an oblong adapter arm;

a bore formed in said adapter arm at one end and in the longitudinal center thereof dimensioned to receive a roller shade support pin and function as a bearing surface for said roller shade support pin; and

means located at the end of said oblong adapter arm opposite said bore containing end for connecting said adapter arm to said support arm so that said adapter arm may be rotated about said means for connecting between a first position wherein said slot and said bore are in alignment at the longitudinal center of said support arm and a second position wherein said adapter arm will not interfere with said roller shade spring bar.

4,249,715

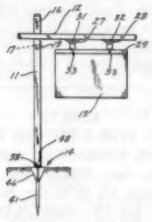
SIGN APPARATUS

Garry E. Repp, 2605 Maple, Norfolk, Nebr. 68701

Filed Jul. 20, 1979, Ser. No. 59,455

Int. Cl.[3] **F16M** *13/00*

U.S. Cl. 248—545 **13 Claims**



1. Sign mounting apparatus comprising:

a tubular post member adapted to be mounted in a vertically oriented position;

a horizontal member;

means for removably attaching said horizontal member to said tubular post member;

means for attaching a sign to said horizontal member; and

post driving means for securing said post to the ground by reciprocal movement of said post member comprising:

a closure member secured to the bottom end of said tubular post member and having a central opening therein;

a shaft reciprocally mounted in said opening and movable between a first position extending a substantial distance into said tubular post member and a second position substantially outside of said tubular post member;

a first stop means on an upper end of said shaft for preventing said shaft from dropping downwardly out of said opening;

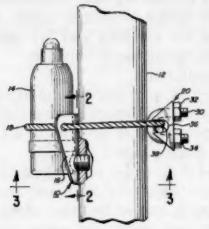
a second stop means secured to a central portion of said shaft for preventing said shaft from entering said opening beyond the second stop means; and

means for preventing said post member from rotating with respect to said shaft, said rotation prevention means comprising a non-circular cross sectional shape on said tubular post member and a complementary non-circular shape on said first stop means, said first stop means being slideably disposed within said tubular post member.

4,249,716
VALVE CLAMP ASSEMBLY

John O. Barron, 5111 W. Van Buren St., Chicago, Ill. 60644

Filed Jun. 28, 1979, Ser. No. 52,836
Int. Cl.[3] F16K *51/00*
U.S. Cl. 251—146 6 Claims

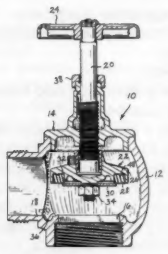


1. Apparatus for retaining a valve on a radiator, said apparatus comprising: an elongate stranded cable for securing said valve to said radiator; a plate having apertures through which said cable extends and means for attaching said plate to said valve for holding said cable in position relative to said valve; and a clamp for maintaining said cable on said radiator including a U-shaped bolt threaded at each end, a fastener adapted for reciprocal movement on said bolt so as to define an opening between the apex of said fastener and the vertex of said bolt through which the ends of said cable extends and means adapted for threaded engagement of the ends of said bolt for adjusting the position of said fastener relative to said bolt so as to vary the distance between the apices thereof and thereby restrain said cable therebetween; whereby rotational and translational motion of said valve is inhibited by said apparatus.

4,249,717
SEAL FOR A LIQUID VALVE

William S. Thompson, Elkhart, Ind., assignor to Elkhart Brass Manufacturing Co., Inc., Elkhart, Ind.

Filed Oct. 17, 1979, Ser. No. 85,697
Int. Cl.[3] F16K *25/00*
U.S. Cl. 251—210 4 Claims

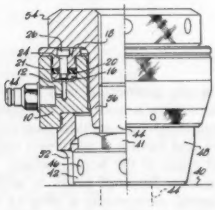


1. In a valve including a housing having an inlet and an outlet and a valve seat, a stem shiftably carried by said housing and including an inner part which projects into the housing and which mounts a valve member and an axially shiftable outer projecting part which mounts a hand grip, said valve member being shiftable toward and away from said valve seat to regulate liquid flow through said valve outlet as said outer stem part is axially shifted, said valve member having a closed position in contact with said valve seat, said valve seat including an annular sealing surface having an inner circumferential end edge defining said valve inlet, said valve member including a disk part having an annular groove formed therein, said groove defined by spaced side walls and a base wall located in an opposed relationship with said valve seat sealing surface as said valve member is shiftable toward and away from said valve seat, a resilient annular seal member carried within said disk part groove, the improvement wherein said valve seat sealing surface includes a first annular planar section and a second annular planar section radially outset and offset downstream from said first planar section and separated therefrom by a conical section, said first planar section terminating at said inlet inner end edge, said groove base wall carrying an annular rib located between the side walls thereof and positionable over said first planar section of the valve seat sealing surface as said valve member is shifted into its closed position with said seal member being resiliently compressed between said rib and said first planar section.

4,249,718
BOLT TENSIONING DEVICE

Frederick Heaton, Norton Canes, Nr. Cannock, England, assignor to Hydra-Tight Limited, Manchester, England

Filed Apr. 10, 1979, Ser. No. 28,856
Claims priority, application United Kingdom, Apr. 18, 1978, 15305/78
Int. Cl.[3] E21B *19/00*
U.S. Cl. 254—29 A 11 Claims



1. A device comprising a body, a piston mounted in said body, the piston and the body being of generally annual configuration to allow the device to be assembled in encircling fashion to a bolt or like components, and an annular chamber between the body and the piston for the admission of fluid under pressure to effect relative axial displacement of the body and the piston whereby the axial dimension is increased, the piston comprising an inner part having a pressure area which is subject to the pressure in said chamber and an outer part to which the fluid pressure is transmitted via said inner part and an interposed mass of solid, yielding and substantially incompressible material, said mass having an effective pressure area less than that of said inner piston part, and means communicating the pressure in said chamber to the effective pressure area of said inner piston part, said mass being free for radial expansion, so as to seal against leakage of fluid from the chamber while at the same time transmitting the pressure to the outer piston part.

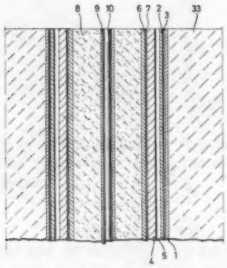
4,249,719
TUYERE FOR THE INJECTION OF REACTION GAS

Helmut Knuppel; Karl Brotzmann; Hans-Georg Fassbinder, and Ernst Fritz, all of Sulzbach-Rosenberg, Fed. Rep. of Germany, assignors to Eisenwerk-Gesellschaft Maximilianshutte mbH, Sulzbach-Rosenberg, Fed. Rep. of Germany

Filed Aug. 7, 1975, Ser. No. 602,870
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1974, 2438142
Int. Cl.[3] C21B *7/16*
U.S. Cl. 266—47 27 Claims

1. In a tuyere for the injection of reaction gas, with or without load of solid materials into vessels for refining metals, the tuyere being installed in the refractory lining of the vessels and

burning-back in conformity with the wear of this refractory lining, and in order to avoid reactions between the tuyere material and the refining gas, a gaseous and/or liquid protective medium is supplied to the tuyere, separately from a reaction gas supplied through a supply channel, the improvement which consists in that inside said supply channel of the tuyere for the reaction gas, a solid center is provided, which is not passed through by reaction gas and that in the cross section of the tuyere the supply channel for the reaction gas appears as a slot or in a shape similar to an annular slot surrounding the periphery of said solid center.

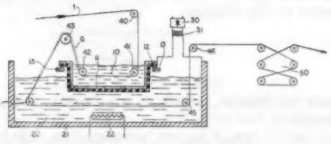


24. A process for treating a molten metal bath in a refractory-lined vessel comprising, injecting into said molten metal an annular-like stream of refining gas; and simultaneously injecting two annular-like streams of protective jacket fluid, one concentrically inside the refining gas stream, and the other concentrically outside the refining gas stream with both of said streams of protective jacket fluid being contiguous on one side thereof with said refining gas stream and on the other side thereof with said molten metal bath.

4,249,720
APPARATUS FOR THE CONTINUOUS TREATMENT OF METAL OBJECTS

Karl Weyand, and Günter Stock, both of St. Ingbert, Fed. Rep. of Germany, assignors to Trefilarbed S.A., Luxembourg, Luxembourg

Filed Jul. 2, 1979, Ser. No. 55,190
Claims priority, application Luxembourg, Jul. 3, 1978, 79911
Int. Cl.³ C21D *9/62, 1/40, 1/48, 9/52*
U.S. Cl. 266—104 **5 Claims**



1. An apparatus for the heat treatment of a continuous metal element, comprising:

an upwardly open first vessel receiving a first molten metal bath for preheating said element, said vessel being formed with an electrically insulating thermally conductive wall;

a second upwardly open vessel receiving a second bath of molten metal for the quenching of said element, said first vessel being immersed in the said second vessel with said wall in direct heat conducting relationship between said baths;

means for conducting said element through said first bath along a resistance heating stretch, and then through said bath in said second vessel and thereafter out of said bath in said second vessel whereby said element is preheated in the bath in said first vessel and is quenched in the bath of said second vessel; and

an electric current supply connected across the baths in said vessels whereby an electric current is passed through said element over said stretch to heat said element.

4,249,721
APPARATUS FOR PREHEATING MATERIAL TO BE CHARGED INTO STEEL MAKING EQUIPMENT

Eiji Udo, Nishinomiya, Japan, assignor to Nikko Industry Co., Ltd., Hyogo, Japan

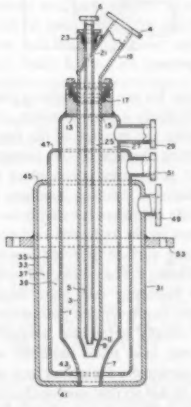
Filed May 31, 1979, Ser. No. 44,070
Int. Cl.³ C21C *5/38*
U.S. Cl. 266—156 **7 Claims**

1. An apparatus for preheating the material to be charged into a steel making furnace with the heat energy of exhaust gas from a dust collecting combustion chamber for the furnace, the apparatus comprising a plurality of preheating pits each communicating with an outlet duct of the combustion chamber; a charging bucket removably positioned in each of the preheating pits wherein a clearance for the passage of an exhaust gas is provided between the bucket and the inner wall of the preheating pit; coupling means coupling the preheating pits to the outlet duct of the combustion chamber; the charging bucket having exhaust gas passage means in the interior thereof for distributing the heated exhaust gas throughout the charging bucket, the charging bucket having openable bottom means at the bottom thereof; and a transfer duct having a hood at one end thereof, the other end of the transfer duct communicating with the combustion chamber, and wherein the hood on the transfer duct is selectively shiftable to a position covering the top of the charging bucket placed in one of the preheating pits, thereby closing the bucket whereby the exhaust gas from the combustion chamber is passed through the transfer duct and the hood into the exhaust gas passage means in the charging bucket to preheat material therein and thereafter flows through the clearance and the coupling means to the outlet duct of the combustion chamber.

4,249,722
APPARATUS FOR THE FLASH OXIDATION OF METAL CONCENTRATES

Louis H. Jaquay, Pittsburgh, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Filed May 11, 1979, Ser. No. 38,322
Int. Cl.³ C22B *1/10*
U.S. Cl. 266—172 **5 Claims**



1. A burner for use in the flash oxidation of metal concentrates comprising:

an outer, intermediate and inner tube each having a venturi nozzle on a first discharge end thereof;

means for mounting the intermediate tube concentrically within the outer tube with the nozzle on the discharge end of the intermediate tube partially extending into the nozzle on the discharge end of the outer tube;

means for mounting the inner tube concentrically within the intermediate tube with the nozzle on the discharge end of the inner tube partially extending into the nozzle on the discharge end of the intermediate tube;

first inlet means on the second end of the outer tube through which an oxidizing gas is introduced into the annular space between the intermediate and outer tubes at a first pressure;

second inlet means on the second end of the intermediate tube through which particles of metal concentrates are introduced in the annular space between the inner and the intermediate tubes; and

third inlet means on the second end of the inner tube through which additional oxidizing gas is introduced at a second pressure greater than said first pressure, such that the particles of metal concentrate are injected into the oxidizing gas in the nozzle at the discharge end of the outer tube at high velocity by the additional oxidizing gas.

4,249,723

COOLING DEVICE FOR SMELTING PLANTS

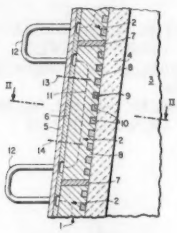
Bruno Kämmerling, Dinslaken, and Axel Kubbutat, Oberhausen, both of Fed. Rep. of Germany, assignors to Gutehoffnungshütte Sterkrade Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Jun. 11, 1979, Ser. No. 47,043

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1978, 2825932

Int. Cl.³ F27B *1/24*

U.S. Cl. 266—193 **17 Claims**



1. Cooling device for use in a smelting plant such as in a blast furnace and particularly a shaft furnace, comprising a refractory layer for lining the interior of the furnace, a steel jacket forming the exterior surface of the furnace and spaced outwardly from said refractory layer, plate members including means for circulating a cooling medium through said plate members, said plate members located between said refractory layer and said steel jacekt and each said plate member having an outwardly facing surface directed toward said steel jacket and an inwardly facing surface directed toward said refractory layer, means for fastening said plate members to said steel jacket, wherein the improvement comprises that said fastening means comprise axially extending anchoring members each secured within one said plate member and extending outwardly from the outwardly facing surface of said plate member toward said steel jacket so that said anchoring members extend only from the outwardly facing surfaces of said plate members, and said plate members are cast members and said anchoring members are cast into said plate members.

4,249,724

APPARATUS FOR TEMPERING THE SURFACES OF MUTUALLY DISPLACED CAMS OF A CAST-IRON CAMSHAFT

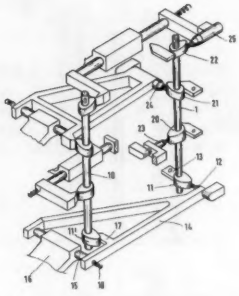
Friedhelm Reinke, and Edgar Stengel, both of Remscheid, Fed. Rep. of Germany, assignors to AEG-Elotherm, G.m.b.H., Remscheid, Fed. Rep. of Germany

Filed Sep. 27, 1979, Ser. No. 79,562

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1978, 2853964

Int. Cl.³ C21D *1/08*

U.S. Cl. 266—261 **1 Claim**



1. In an apparatus for tempering the surfaces of cams mutually angularly and longitudinally displaced along the longitudinal axis of a cast-iron camshaft, said apparatus including means for mounting the camshaft to be tempered for rotation about its axis of rotation, for fusing-on of the surface of said cams, a plurality of energy sources, each energy source corresponding to one of said cams, each energy source respectively disposed at the periphery of said camshaft to be tempered and movable toward and away from the surfaces of said corresponding cam, a master camshaft having master cams, drive means for synchronously rotating said master camshaft and said camshaft to be tempered in parallel spaced relation, means, scanning the surfaces of said master cams, for adjusting the distance of the energy sources from said axis of rotation, and means for moving said camshaft to be tempered in the direction defined along said axis of rotation, the improvement comprising means for supporting said camshaft to be tempered in a vertical orientation, said energy sources being respectively disposed at angular distance relative to one another corresponding to the angular displacements of said cams of said camshaft to be tempered relative to one another.

4,249,725

EXERCISE APPARATUS

Ernest M. Mattox, 18509 E. 6th St. No., Independence, Mo. 64056

Filed Jan. 29, 1979, Ser. No. 7,510

Int. Cl.³ A63B *21/06, 21/20, 21/22*

U.S. Cl. 272—117 **14 Claims**

1. Exercise apparatus including:

a rotor;

means supporting said rotor for rotation thereof about a certain axis;

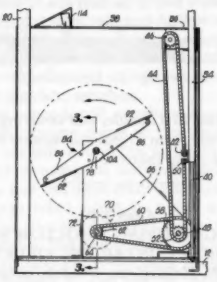
manually operable drive means coupled with said rotor for effecting said rotation,

said rotor being capable during said rotation of creating resistance to the manual efforts of a user to operate said drive means,

said rotor including fluid-drag means associated therewith for creating said resistance through interaction with a fluid medium during said rotation.

said drag means being selectively shiftable radially inwardly

and outwardly with respect to the axis of rotation of the rotor for adjustment of the radial distance between said axis and the point of application of said resistance; and



mechanism for effecting said shifting adjustment of said drag means and for releasably retaining the same in a selected radial position.

4,249,726

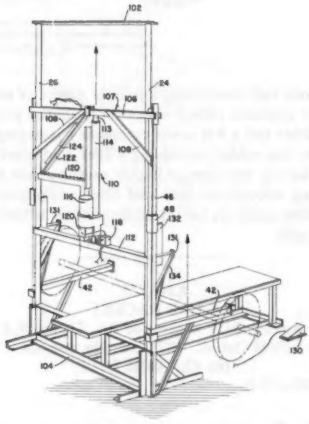
EXERCISE BENCH SAFETY DEVICE

Reginald O. Faust, 41 Oak Ct., Annapolis, Md. 21401

Filed May 22, 1979, Ser. No. 41,504

Int. Cl.³ A63B *13/00*

U.S. Cl. 272—123 **8 Claims**



1. In combination, a bench for supporting an exerciser lying on his back for bench press exercises with a bar bell, said bench having opposed sides and front and rear ends, and means controllable by an exerciser for automatically elevating the bar bell independently of lifting effort by the exerciser; said elevating means comprising a vertical frame adjacent the front end of said bench, vertically moveable arm means carried by said frame and extending in the direction of the rear end of said bench a distance sufficient to intersect the normal path of movement of a bar bell being utilized by an exerciser lying on said bench, power means having an operative connection with said arm means for raising the arm means from a predetermined lowered position wherein the arms are clear of the normal path of movement of a bar bell during exercising to an elevated position clear above the body of an exerciser, control means selectively operable by a body part of an exerciser for effecting operation of said power means to raise said arm means from said lowered position into engagement with a bar bell currently in use by an exerciser, said power means having the capacity to exert an upward force on said arm means which is in excess of a downward force exerted by the weight of a bar bell engaged by said arm means, means for stopping operation of said power means when said arm means arrives at said elevated position, and means for retaining said arm means in said elevated position for at least sufficient time to enable an exerciser to move clear of the path of movement of said arm means.

4,249,727

FRICTION TYPE GYMNASTIC APPARATUS

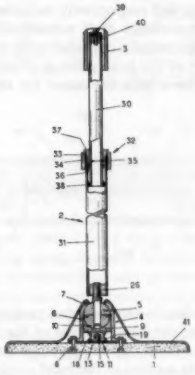
Charles J. M. Dehan, Montpellier, France, assignor to Etablissement Ariabel, Vaduz, Liechtenstein

Filed Sep. 12, 1978, Ser. No. 941,747

Claims priority, application France, Sep. 15, 1977, 77 27907

Int. Cl.³ A63B *21/22*

U.S. Cl. 272—132 **1 Claim**



1. Gymnastic apparatus for strengthening body muscles, comprising a base; a bar supported by said base; means connecting one end of said bar and said base for providing limited rotary movement of said bar relative to said base; the connecting means comprising a ball connected to one end of said bar and a socket for receiving said ball connected to said base; said bar comprising a plurality of interfitting parts whereby it may be adjustable in length; a wedge for engaging said connecting means and urging said socket against said ball and varying the force necessary to move said bar relative to said base; adjustable means connected to said wedge for moving said wedge relative to said socket; said ball having two substantially hemispherical bodies; each body having an opening therein of polygonal sectional configuration; a connector assembly interposed said bar and said ball received in said opening; said connector assembly comprising a bolt having a threaded end, and a nut means mounted on one end of said bar for engaging said threaded end; said bolt having an end of polygonal sectional configuration for interfitting with the ball opening of polygonal sectional configuration.

4,249,728

TENNIS RACKET EXERCISE WEIGHT ASSEMBLY

Richard L. Bratt, 31 Laurel Hill La., Holden, Mass. 01520

Continuation of Ser. No. 763,532, Jan. 28, 1977, abandoned. This application Jan. 19, 1979, Ser. No. 4,658

Int. Cl.³ A63B *69/38*

U.S. Cl. 273—29 A **1 Claim**

1. A selectively weighted and air restrained tennis racket assembly for practice strokes comprising, in combination,

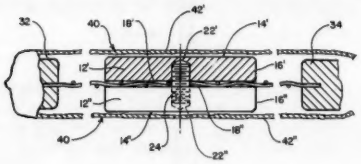
a tennis racket with a relatively enlarged eliptical head portion supporting first and second spaced series of crossed interwoven strings under tension and a relatively

reduced elongated handle portion attached to and supporting the head portion,

a tennis racket head portion cover made of relatively air impervious flexible material forming first and second side sections thereof of the size and shape required and mutually interconnected so as to enclose the periphery and the opposite sides of the head portion of the tennis racket and to releasably secure the tennis racket cover to the head portion of the tennis racket, and

an exercise weight assembly including first and second opposed coacting weight elements selectively located lengthwise and transversely of the head portion of said tennis racket and disposed on opposite sides of the crossed interwoven strings and mutually interconnected,

said first and said second coacting weight elements respectively including first and second coacting locking surfaces selectively releasably mutually interengaged so as to maintain the first and second weight elements in clamping engagement with the opposite sides of the crossed interwoven strings, and respectively including first and second opposite side surfaces each substantially planar and respectively substantially coplanar with the first and second opposite sides of the head portion of said tennis racket, so as to fit readily within the cover for the head portion of



said tennis racket in any selected position lengthwise and transversely of the head portion of the tennis racket, and so as to support and thereby stabilize a substantial central area of the side section of the head portion cover resistant to ambient air pressure during swinging movement of said tennis racket,

whereby the restraint upon the swinging movement of said tennis racket assembly during each practice stroke remains more nearly constant throughout the stroke, because the restraint on the tennis racket due to the inertial effect of the exercise weight assembly starts high, decreases with decreasing acceleration, and then increases again with increasing deceleration, and ends high, as an inverse function of the varying rate of the swinging movement, while the restraint on the tennis racket produced by air drag on the head portion cover first increases from zero to a maximum and then decreases to zero again as a direct function of the varying rate of the swinging movement during the same practice stroke, so the forces constraining movement of the tennis racket throughout the practice stroke remain more nearly constant, when both the exercise weight assembly and the cover are mounted in operative relation to the head portion of the tennis racket.

4,249,729

TENNIS EXERCISE AID

Pericles Gabrielidis, 14141 Riverside Dr., #2, Sherman Oaks, Calif. 91423

Filed Dec. 17, 1979, Ser. No. 104,198
Int. Cl.[3] A63B *61/00*
U.S. Cl. 273—29 A **2 Claims**

1. A tennis exercise aid comprising:

a tight wound tension spring having first and second ends;

first and second manually graspable handles respectively secured to said first and second ends of said spring, said first handle being configured to be used as a standard tennis racquet handle and being substantially octagonal in cross section, a high friction covering on said first handle, said second handle having a core of rigid material having a substantially octagonal cross-sectional configuration and having a covering material thereon different from said

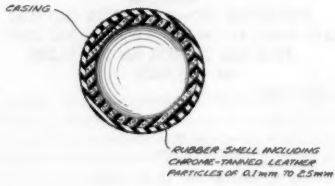
covering on said first handle, said covering material comprising a resilient foam so that said second handle requires a firm manual grasp thereon.

4,249,730

TENNIS BALL COMPRISING A HOLLOW SPHERE OF A RUBBER CONTAINING FILLER

Lennart J. F. Frisk, Helsingborg, Sweden, assignor to Tretorn Aktiebolag, Helsingborg, Sweden

Continuation-in-part of Ser. No. 770,405, Feb. 22, 1977, abandoned. This application Sep. 20, 1978, Ser. No. 943,780
Claims priority, application Sweden, Mar. 3, 1976, 7602979
Int. Cl.[3] A63B *39/02, 41/02*
U.S. Cl. 273—61 C **2 Claims**



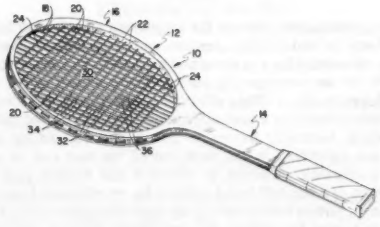
1. A tennis ball comprising: a hollow sphere of natural rubber and/or synthetic rubber similar in resilience properties to natural rubber and a felt cover completely jacketing said hollow sphere, said rubber containing a filler, said sphere containing a gas having the same or higher pressure than that of the surrounding atmosphere, and said filler comprising chrome-tanned leather particles having all dimensions within the range of 0.1–2.5 mm.

4,249,731

GAME RACKET

Harlan D. Amster, 2419 Brentwood Rd., Union, N.J. 07033

Filed Oct. 31, 1977, Ser. No. 846,674
Int. Cl.[3] A63B *51/02*
U.S. Cl. 273—73 D **2 Claims**



1. A game racket, comprising:

a frame including a handle,

a plurality of longitudinally-disposed strings connected to said frame and disposed in a first plane,

a plurality of transversely-disposed strings connected to said frame and disposed in a second plane to define a playing

area, said second plane being substantially parallel to said first plane in at least the central area of said frame, and

a grid in said central area including a plurality of longitudinally-disposed first members each slidably disposed on separate ones of less than all of said plurality of longitudinally-disposed strings, said grid further including a plurality of transversely-disposed second members each slidably disposed on separate ones of less than all of said plurality of transversely-disposed strings so that said second members cross said first members,

said first and second grid members being connected at a plurality of crossing points so that said grid moves substantially as a unit, and so that said grid and said less than all of said plurality of longitudinally-disposed strings move as a unit and slide relative to said transversely-disposed strings when struck by a ball in one direction to increase the amount of top spin or back spin imparted to said ball, and so that said grid and said less than all of said plurality of transversely-disposed strings move as a unit and slide relative to said longitudinally-disposed strings when struck by a ball in another direction to increase the amount of side spin imparted to said ball, and

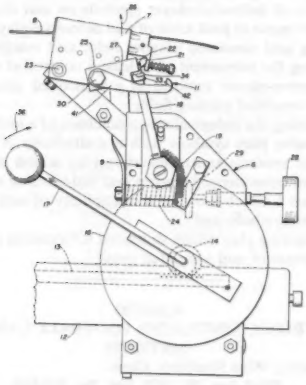
wherein the space between said grid and said frame includes transversely-disposed strings interwoven with said longitudinally-disposed strings.

4,249,732

STRING PRE-STRETCHING APPARATUS AND METHOD FOR RACKET STRINGING MACHINE

John A. Balaban, 4142 Graham St., Pleasanton, Calif. 94566

Filed Feb. 12, 1979, Ser. No. 11,145
Int. Cl.[3] A63B *51/16*
U.S. Cl. 273—73 A **5 Claims**



1. In a racket stringing machine having a racket head holding fixture and a carriage mounted for reciprocation toward and away from said fixture and a string clamp carried by said carriage for engaging a string drawn through a racket head mounted on said fixture and means for moving said carriage away from and toward said fixture for respectively increasing and decreasing the tension of said string;

a brake for locking the position of said carriage relative to said fixture for maintaining said string at a predetermined tension; and

means functioning, on movement of said carriage from an advanced position of string tension substantially greater than said predetermined tension to a retracted position providing said predetermined tension, to apply said brake.

5. The method of setting to a predetermined tension a racket string mounted on a racket head across the interior opening thereof comprising,

drawing said string across said racket head opening to a predetermined elevated tension substantially greater than said predetermined tension to effect a pre-stretching of said string to a length beyond its length at said predetermined tension;

decreasing the string tension to permit contraction of said string to said predetermined tension; and

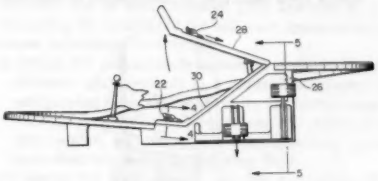
locking said string at said predetermined tension.

4,249,733

TOY RACEWAY

Fred D. Eddins, Mapleville, R.I., and Sidney Tepper, Millburn, N.J., assignors to Hasbro Industries, Inc., Pawtucket, R.I.

Filed Mar. 5, 1979, Ser. No. 17,696
Int. Cl.[3] A63F *9/14*
U.S. Cl. 273—86 C **7 Claims**



7. A racing toy comprising, a raceway including at least one main track having an elevated initial end portion and a lower terminal end portion so as to define a downhill path and at least one gravity operated vehicle for movement along said path, said main track ends spaced from each other and a pivotally mounted connecting ramp disposed between said main track ends in said space therebetween, said pivotal connecting ramp having a first vehicle receiving portion and an adjacent second vehicle launching portion, said vehicle receiving portion proximal the terminal end of said main track and forming a continuation thereof when said ramp is in a lower vehicle receiving position, means for manually pivotally elevating said ramp from its lower vehicle receiving position to an upper vehicle launching position wherein said ramp is elevated above said initial end of said main track, and positive retaining means for retaining said vehicle on the upper surface of said ramp while elevating said ramp, said raceway having two side by side equal length main tracks, each said track having a connecting ramp associated therewith, separate handles outwardly projecting from said ramps in a position generally transversally disposed thereto and in turn connected to separate elevating means for each of said ramps, said handles operable by child players separately operating said ramps so as to enable said vehicles to cycle its respective downhill path a selected number of times.

4,249,734

HAND-HELD TWO-PLAYER ELECTRONIC FOOTBALL GAME

Eric Bromley, West Simsbury, Conn., assignor to Coleco Industries, Inc., Hartford, Conn.

Filed Feb. 26, 1979, Ser. No. 15,129
Int. Cl.[3] A63F *9/00*
U.S. Cl. 273—94 **11 Claims**

1. In an apparatus for simulating a sports action two team game, the combination comprising:

a. a hand-holdable housing having two end portions and an intermediate portion;

b. a display panel on the upper surface of said intermediate portion and including a visual simulation of a playing field and adapted to display symbols in response to electrical signals applied thereto;

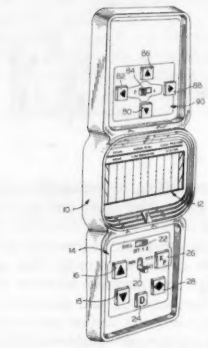
c. operational-circuit means in said housing and operatively connected to said display panel for generation and transmission of electrical signals to said display panel to produce symbols on said simulated playing field, said symbols

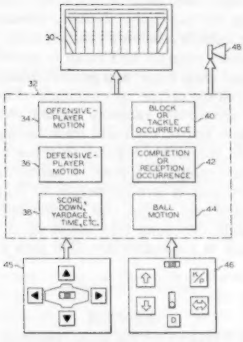
simulating a multiplicity of offensive play symbols and a multiplicity of defensive-player symbols, one of said offensive play symbols at a time simulating the position of a ball, said operational-circuit means including:

(i) means for moving a multiplicity of said offensive play symbols along said playing field;

(ii) means for moving at least ome of said defensive-player symbols along said playing field in a variable manner and at least a controllable one of said defensive player symbols along said playing field in a controlled manner, movement of said offensive play symbols and defensive-player symbols providing play action simulating the action of said sports action team game;

(iii) means for detecting the independent coincidence of a multiplicity of offensive play symbols with a multiplicity of defensive-play symbols and terminating play action upon detection of coincidence of said ball-position symbol with at least a selected one of said defensive-player symbols;





(iv) means for monitoring play action to record information concerning the status of said simulated game and for producing signals indicative of said status information, said signals being transmitted to said display panel to display said status information on said display panel; and

d. a multiplicity of manually operable control elements in at least each of said end portions of said housing and providing an offensive control unit in one end portion and a defensive control unit in the opposite end portion thereof, said control elements being connected to said operational-circuit means for transmission of signals to said operational-circuit means through manual operation of said control elements, said offensive-movement means being arranged to produce movement of at least one of said offensive play symbols in response to signals transmitted from said offensive unit control elements, said defensive-movement means being arranged to produce movement of said controllable defensive-player symbol in response to signals transmitted from said defensive unit control elements, said control elements including means for disabling said defensive control unit to permit one player operation of said apparatus combination and said operational circuit means including means for assuming the internal operation of said defensive movement means to effect only variable movement of said defensive-player symbols.

8. In a method of playing a simulated sports-action two team game, the steps of:

a. providing a hand-holdable housing having two end portions and an intermediate portion with a display panel in said intermediate portion that includes a visual simulation of a playing field and is adapted to display symbols in response to electrical signals applied to it, said housing including operational circuit means therewithin, and a multiplicity of manually operable control elements in at least each of said end portions of said housing, said manually operable control elements being operable by a pair of players competing with each other;

b. manipulating said manually operable control elements in one end portion to effect operation of said operational circuit means to generate electrical signals and transmit them to said display panel to produce a multiplicity of offensive play symbols on said display panel, one of said offensive play symbols at a time simulating the position of a ball, and to move a multiplicity of said offensive play symbols in a controlled manner along said simulated playing field;

c. manipulating said manually operable control elements in the other of said end portions to generate and transmit electrical signals to said display panel to produce a multiplicity of defensive-player symbols on said display panel and to move at least some of said defensive-player symbols along said simulated playing field, said manipulation effecting the movement of at least a controlled one of said defensive-player symbols in a controlled manner along said simulated playing field;

d. detecting the independent coincidence of a multiplicity of offensive play symbols with a multiplicity of defensive-player symbols and terminating play action upon detection of coincidence between said ball-position symbol and at least a selected one of a multiplicity of said defensive-player symbols; and

e. monitoring play action to record information concerning the status of said simulated game.

4,249,735

ELECTRONIC SIMULATED FOOTBALL GAME AND METHOD

Eric Bromley, West Simsbury, Conn.

Filed Jun. 28, 1978, Ser. No. 919,860
Int. Cl.[3] **A63F** *9/00*
U.S. Cl. 273—94 **57 Claims**

14. In a method for simulating a sports-action team game, the steps comprising:

a. providing a hand-holdable housing having a display panel including a simulated playing field of the type on which a ball-type game is played and adapted to display symbols in response to electrical signals applied thereto;

b. generating and transmitting electrical signals to said display panel to produce on said simulated playing field a multiplicity of offensive play symbols and a multiplicity of defensive-player symbols, one of said offensive play symbols at a time simulating the position of the ball;

c. providing means for moving a multiplicity of said offensive play symbols along said playing field under manual control;

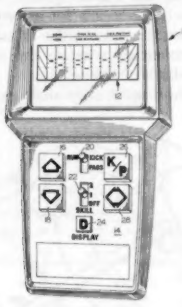
d. selecting one of at least two play action modes, one of said modes being a "rushing" mode which simulates the "running" action of the ball-position symbol, and another

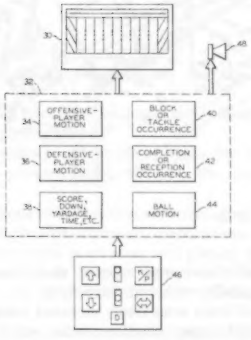
mode being a "passing" mode which simulates the "passing" of the ball-position symbol to an intended "receiver" symbol;

e. moving at least a selected one of said offensive play symbols by manipulation of said manual control means, said moved offensive play symbols in the "running" mode being the ball-position symbol and at least one other offensive play symbol simulating a "blocker";

f. moving concurrently a plurality of said defensive-player symbols in a variable manner towards the ball-position symbol, movement of said offensive play symbols and defensive-player symbols providing play action simulating the action of said sports action team game;

g. detecting the independent coincidence of a multiplicity of offensive play symbols with a multiplicity of defensive-player symbols and terminating play action upon the detection of coincidence between said ball-position sym-





bol with any one of a selected multiplicity of defensive-player symbols;

h. when in said running mode, prohibiting the movement towards said ball-position symbol of at least some of said coincident defensive-player symbols coincident with an offensive play symbol other than said ball-position symbol to simulate "blocking" of the defensive-player symbols;

i. when in said passing mode, moving said "receiver" symbol through the defensive-player symbols and aligning said "receiver" symbol with said ball-position symbol, and thereafter advancing the ball-position symbol along a linear path towards the "receiver" symbol, coincidence of said ball-position symbol with said "receiver" symbol repesenting a "completed" pass and coincidence of said advancing ball-position symbol with at least a selected one of said defensive-player symbols representing an "intercepted" pass;

j. monitoring play action to record information concerning the status of said simulated game; and

k. displaying said status information.

26. In an apparatus for simulating a sports action team game, the combination comprising:

a. a hand-holdable housing;

b. a display panel on the upper surface of said housing and including a visual simulation of a playing field of the type on which a ball-type game is played and adapted to display symbols in response to electrical signals applied thereto;

c. operational-circuit means in said housing operatively connected to said display panel for generation and transmission of electrical signals to said display panel to produce on said simulated playing field a multiplicity of offensive play symbols and a multiplicity of defensive-player symbols, one of said offensive play symbols at a time simulating the position of the ball, said operational-circuit means including:

(i) means for concurrently moving a multiplicity of said offensive play symbols in a controlled manner along said playing field, said multiplicity of symbols including said ball-position symbol and at least one other offensive play symbol, said movement being generally in a common direction along said playing field;

(ii) means for concurrently moving a plurality of said defensive-player symbols along said playing field in a variable manner towards the ball-position symbol, movement of said offensive play symbols and defensive-player symbols providing play action simulating the action of said sports-action team game;

(iii) means for detecting the independent coincidence of a multiplicity of offensive play symbols with a multiplicity of defensive-player symbols, said detecting means terminating play action upon detection of a coincidence of said ball-position symbol with any one of a selected multiplicity of defensive-player symbols, said detecting means permitting continuation of play action upon detection of coincidence with a defensive-player symbol of an offensive play symbol other than said ball-position symbol and said detecting means prohibiting the movement of said defensive-player symbol coincident with said offensive play symbols other than said ball-position symbol towards said ball-position symbol to simulate "blocking" of said last-mentioned defensive-player symbol;

(iv) means for monitoring play action to record information concerning the status of said simulated game and for producing signals indicative of said status information, said signals conveying the recorded information to the operator of the game; and

d. a control board on said housing including a multiplicity of manually operable control elements, said control board being connected to said operational-circuit means for transmission of signals to said operational-circuit means through operation of said control elements, at least one of said manually operable control elements transmitting signals to said offensive-movement means and producing manually controlled movement of at least said ball-position symbol in response to signals transmitted from said control board, said operational circuit means including means operating upon said offensive play symbol movement means to effect concurrent movement of the ball-position symbol with at least one other offensive play symbol in a generally common direction as the operator manually operates the control elements to effect movement of the ball-position symbol through the defensive-player symbols, said detecting means prohibiting the movement of said defensive-player symbols towards said ball-position symbol upon detection of coincidence of said defensive-player symbols with said other concurrently moving offensive play symbols and said detecting means terminating play action upon coincidence of any one of

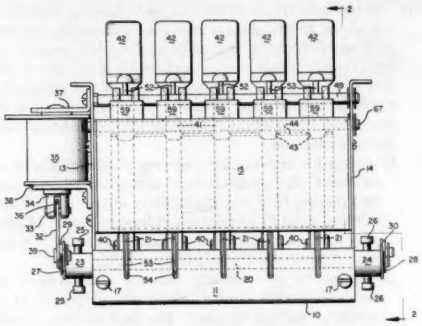
said selected multiplicity of defensive-player symbols with said ball-position symbol.

4,249,736

DROP TARGET ASSEMBLY FOR PINBALL GAME

Martin B. Rosenthal, Glenwood, Ill., assignor to Stern Electronics, Inc., Chicago, Ill.

Filed Jul. 2, 1979, Ser. No. 54,006
Int. Cl.³ A63D *3/02*
U.S. Cl. 273—127 R **9 Claims**



1. A drop target assembly for a pinball game wherein pinballs are put in play on a playfield, said drop target assembly comprising:

a plurality of target members;

means mounting each of said target members for movement, independent of the other target members, between a raised position in which the target member extends above said playfield and a lowered position in which the target member is located below the playfield;

means actuable to elevate each target member to its raised position;

a plurality of latch means, one for each target member;

means mounting each latch means for movement, independent of the other latch means, between operative and inoperative positions;

means normally urging each latch means toward its operative position;

each of said latch means and its correponding target member comprising means cooperating to hold the target member in its raised position, when the latch means is in an operative position, and for permitting the target member to drop to its lowered position in response to impact, from a predetermined direction, by a pinball in play on the playfield;

means, for each latch means, actuable to move said latch means from its operative to its inoperative position, thereby permitting the corresponding target member to drop to its lowered position;

means operable to actuate individual latch-moving means in accordance with a predetermined program;

and means for operating said actuating means in response to the movement of a predetermined number of said target members from their raised to their lowered positions.

4,249,737

AMUSEMENT DEVICE

Kenneth J. Hancherick, Las Vegas, Nev., assignor to Concorde Manufacturing Company, Las Vegas, Nev.

Filed May 14, 1979, Ser. No. 38,618
Int. Cl.³ A63F *5/04*
U.S. Cl. 273—143 R **15 Claims**

1. In an amusement device having a housing, a plurality of rotatable wheels having indicia thereon, means for imparting rotation of said wheels, means for arresting rotation of said wheels, and means for sensing the arrested position of said wheels, the improvement wherein said means for imparting rotation to said wheels comprises:

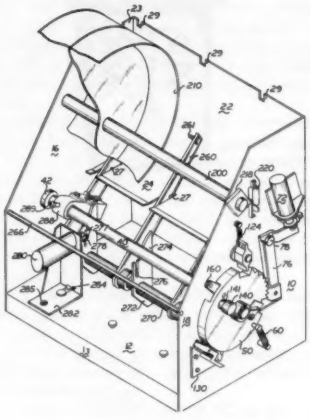
a substantially horizontal drive shaft;

a clutch rotatable through a drive stroke less than 180° mounted in a substantially vertical plane for free rotation on said drive shaft; a crank drive pawl pivotally mounted on said clutch at a pivot location spaced from the center of rotation of said clutch; and

an operating crank non-rotatably affixed to said drive shaft, said operating crank having a drive notch for engagement with said pawl, said clutch being rotatable through a predetermined angle following which said pawl is biased into engagement with said drive notch, said clutch and operating crank thereafter rotating together through a drive portion of the drive stroke.

10. In an amusement device having a housing, a plurality of rotatable wheels having indicia thereon, means for imparting rotation to said wheels, means for arresting rotation of said wheels, and means for sensing the arrested portion of said wheels, the improvement wherein the means for arresting rotation of said wheels comprises:

a substantially horizontal drive shaft mounted in said housing;



a substantially horizontal support shaft mounted in said housing parallel with said drive shaft;

a plurality of index arms freely mounted for pivotal movement on said support shaft, one index arm for each wheel, said index arms each having stop means thereon for arresting rotation of an associated wheel;

springs for biasing said index arms toward said wheels, each wheel having a latch disc rigidly affixed thereto, said wheels and latch discs being rotatable in parallel planes on a common shaft, said latch discs having notches thereon engageable by said stop means on said index arms; a plurality of actuation levers freely rotatable on said support shaft;

a plurality of solenoids each having a moveable member engageable with a respective actuation lever; and

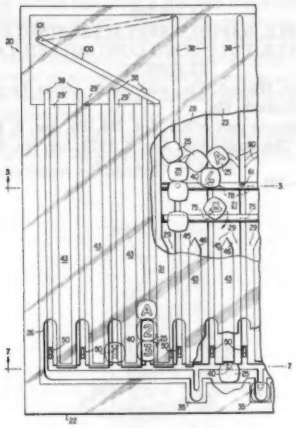
a plurality of index arm latch assemblies rigidly affixed to said drive shaft and rotatable therewith, for moving said index arms out of engagement with said notches in said latch discs and holding said index arms in said non-engaged positions, said latch assemblies being engageable by said actuation levers for releasing said index arms upon actuation of said solenoids.

4,249,738

GAME APPARATUS AND PLAYING PIECE FOR USE THEREWITH

Henry Troeger, Lake Rd., Cooperstown, N.Y. 13326

Filed Dec. 7, 1978, Ser. No. 967,433
Int. Cl.³ A63F *1/04*
U.S. Cl. 273—144 B **21 Claims**



1. Game apparatus comprising:

a plurality of playing pieces having directionally unique features;

a playing board having an enclosed space therein for containing the playing pieces;

partitioning means in the enclosed space for dividing the space into compartments, wherein the compartments include:

a mixing compartment for randomly arranging the playing pieces and parallel columnar compartments for holding the playing pieces in an array said playing pieces being movable solely by gravity between said mixing compartment and at least some of said columnar compartments; and

said partitioning means including gate means disposed between the mixing compartment and the columnar compartments, the gate means including means engageable with said playing pieces for orienting the playing pieces with said directionally unique features similarly disposed.

2. The game apparatus of claim **1** wherein the parallel columnar compartments include:

a first bank of channels disposed adjacent to the gate means for receiving and storing the playing pieces in oriented array;

a second bank of the channels for storing the playing pieces in a selected array, and

wherein the playing board further includes:

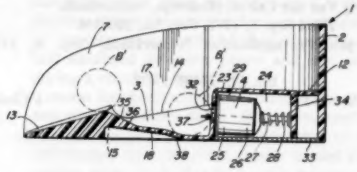
passage means connecting the first and second banks of channels through which passage means playing pieces selected from the first bank of channels can be manually moved to selected channels in the second bank of channels.

4,249,739

GOLF PUTTING PRACTICE DEVICE

John R. Brandell, 427 Shore Line Rd./LBS, Barrington, Ill. 60010

Filed Dec. 10, 1979, Ser. No. 101,868
Int. Cl.³ A63B *69/36, 57/00*
U.S. Cl. 273—179 A **10 Claims**



1. A golf putting practice device comprising:

a. a base including

(1) a ramp sloping upwardly and rearwardly from a front edge thereof to a rear edge thereof,

(2) a pocket

(a) disposed rearwardly of said ramp, and

(b) having

(1') a substantially upright front wall, and

(2') a substantially upright rear wall,

b. kicker means for ejecting a ball forwardly from said pocket,

c. a rib

(1) projecting rearwardly from said front wall in laterally centrally disposed position in said pocket, and

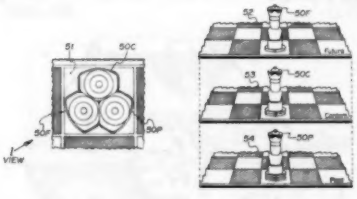
(2) having a top surface sloping downwardly and rearwardly from said front wall in position for balls projected forwardly from said rear wall at a level below the top of said front wall to be deflected upwardly and forwardly out of said pocket.

4,249,740

BOARD AND APPARATUS FOR SIMULTANEOUSLY PLAYING CHESS GAMES

Roland J. Cheney, 3050 Rue d'Orleans, San Diego, Calif. 92110, and Calvin P. Owen, San Diego, Calif., assignors to Roland J. Cheney, San Diego, Calif.

Filed Jul. 23, 1979, Ser. No. 59,550
Int. Cl.³ A63F *3/02*
U.S. Cl. 273—260 **5 Claims**



5. A game set for simultaneously playing at least two interactional games of chess on a single chessboard wherein the pieces from each game have intragame and intergame moving abilities, and wherein the quality and potential of each piece in a current move are affected by its origin and its current location, which comprises:

at least two sets of pieces; and

on each piece, means for indicating its game origin;

means for indicating in which game said piece is currently operating comprising:

a stub projecting from said piece for removably attaching an indicator, said indicator comprising at least two sets of color-coded rings insertable over said stub; and

wherein each of said sets of pieces comprises three subsets of equal numbers of pieces, and a single, standard configuration chessboard.

4,249,741

BOARD FOR THREE PLAYER DRAUGHTS AND THE LIKE

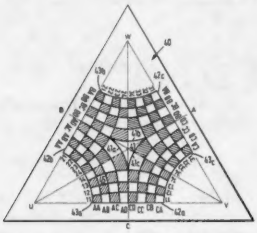
Thomas M. Buijtendorp, Bleiswijk, Netherlands, assignor to Uitgeverij Van der Laken, Bleiswijk, Netherlands

Filed Sep. 5, 1978, Ser. No. 939,354

Claims priority, application Netherlands, Sep. 6, 1977, 7709777

Int. Cl.³ H63F *3/02*

U.S. Cl. 273—261 **6 Claims**



1. A game board with which games that are normally played by two players on a rectangular board of a×b fields can be played by three players on one board with minor adaptations of the rules, characterized by said one board having a hexagonal outer circumference and a blocking area in the centre, there being three lines of symmetry, three opposed sides of the board being bounded by a fields and three other opposing sides by b fields, and the lengths and shapes of the sides and the boundary of the blocking area being designed so as to form a pattern of 3×½a×b substantially rectangular fields of approximately equal size, with the board having three axes of symmetry.

4,249,742

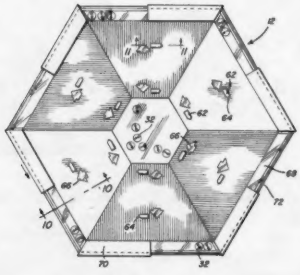
MAGNETIC CARD GAME APPARATUS

Hector F. Vergara, 6235 SW. 59th St., Miami, Fla. 33143, and Manuel Alfonsin, 1080 W. 53rd Ter., Hialeah, Fla. 33012

Filed May 8, 1979, Ser. No. 37,114

Int. Cl.³ A63F *1/02, 1/14*

U.S. Cl. 273—294 **9 Claims**



1. A magnetic card game apparatus comprising a hollow playing board having a shallow cavity disposed interiorly thereof, a plurality of cards movably disposed in the cavity, a selector means disposed exteriorly of the board for manipulation by the players, said cards and selector means including cooperative magnetic means to enable cards within the cavity to be manipulated by moving the selector means along the surface of the playing board, said playing board including a top wall having at least one area thereof transparent to enable observation of the cards, said cavity being divided into a plurality of concentrically arranged areas by concentrically spaced walls with the inner wall defining a central area, an intermediate wall and an outer wall defining concentric intermediate and outer areas, the inner wall and the intermediate wall including passages enabling cards to be moved between the areas.

4,249,743

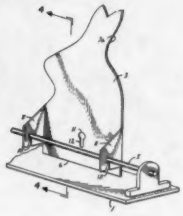
EXPENDABLE, RAPIDLY REPLACED, SINGLE-PART, KNOCK-OVER, PULL CORD CONTROLLED TARGET ELEMENT

Robert W. Lee, Hialeah, Fla., assignor to Action Target Products, Inc., Hialeah, Fla.

Continuation-in-part of Ser. No. 784,356, Apr. 4, 1977, abandoned. This application Aug. 2, 1978, Ser. No. 930,344

Int. Cl.³ F41J *7/04*

U.S. Cl. 273—391 **5 Claims**



4. A target arrangement comprising a single-part target element pivotally mounted to a base means that contains a stationary pivot device, a pull cord for raising said target element from a prone to an upright position said pull cord having enlargement means near its end, and an improvement provided within the boundary of the material substance of said single-part target element that comprises an aperture comprising a first opening and a smaller connected second opening substantially the diameter of said pull cord, said cord having enlargement means near its end for securing to said target, said enlargement means being smaller than said first opening and larger than said second opening whereby said cord is quickly and removably secured in juxtaposition to said single-part target element.

4,249,744

TWO-PLAYER ELECTRONIC SPORTS ACTION GAME

Eric Bromley, West Simsbury, Conn., assignor to Coleco Industries, Inc., Hartford, Conn.

Filed Feb. 26, 1979, Ser. No. 15,130

Int. Cl.³ A63F *9/00*

U.S. Cl. 273—859 **23 Claims**

1. A hand-held electronic game for simulating a sports-action game comprising:

A. a housing adapted to be held in a human hand;

B. a display panel on said housing and including:

(i) means simulating a multiplicity of stationary offensive players visible upon the outer surface of said display panel at predetermined stationary offensive-player positions thereon;

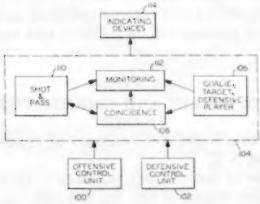
(ii) means simulating a stationary goal visible upon the outer surface of said display panel at a predetermined stationary goal position thereon;

(iii) at least one pass path of discrete electrically actuatable visual-image-producing devices between at least one pair of said simulated offensive players and operable by application thereto of electrical signals to provide images visible on said surface of said panel;

(iv) at least one shot path of discrete electrically actuatable visual-image-producing devices between at least one of said offensive players and said goal and operable by application thereto of electrical signals to provide images visible on said surface of said display panel; and

(v) at least one defensive path of discrete visual-image-producing devices intersecting at least one of said shot and pass paths and operable by application thereto of electrical signals to provide images visible on said surface of said display panel, said offensive player simulating means including a discrete electrically actuatable offensive player visual-image-producing device disposed at the position of each one of said stationary simulated offensive players and operable by application thereto of electrical signals to provide an image visible on said surface of said display panel at the position of said simulated offensive player;

C. status information means mounted in said housing and operable by application thereto of electrical signals to display status information;



D. operational-circuit means contained in said housing, electrically connected to said visual-image-producing devices and said status-information means for generation and transmission of electrical signals thereto and including:

(i) offensive simulation means including means for actuating one of said offensive player visual-image-producing devices at a time to simulate possession of a game object by one of said simulated stationary offensive players, means for consecutively actuating said visual-image-producing devices in a pass path beginning at the position of the most recently actuated offensive player visual-image-producing device to simulate a pass of the game object by said simulated player most recently in possession, and means for consecutively actuating said visual-image-producing devices in a shot path beginning at the position of the most recently actuated offensive player visual-image-producing device towards said simulated goal;

(ii) defensive simulation means for actuating various of said visual-image-producing devices of said defensive-player path to simulate the presence and movement of at least one defensive player along said defensive-player path;

(iii) coincidence-detection means for detecting the simulated coincidence of said simulated game object and said simulated defensive player and for affecting the operation of said offensive simulation means to simulate an incomplete pass upon coincidence of said defensive player and said game object during a simulated pass and to simulate an unsuccessful shot upon coincidence of said simulated defensive player and said game object during a simulated shot;

(iv) means for monitoring play action to record information concerning the status of the simulated game and operable to produce signals indicative of said status information and apply said signals to said status-information means to display said status information; and

E. a multiplicity of manually operable control elements mounted in said housing and providing offensive and defensive control units, said manually operable control elements being electrically connected to said operational-circuit means for transmission of signals to said operational-circuit means by operation of said control elements, said offfensive simulation means simulating passes and shots in response to signals transmitted from said manually operable control elements of said offensive control unit, and said defensive simulation means simulating movement of said simulated defensive player in response to signals transmitted from said manually operable control elements of said defensive control unit, said offensive simulation means retaining the simulation of a game object coincident with the offensive player visual-image-producing device upon completion of a pass until further actuation of said offensive control unit of said manually operable offensive control elements, said control elements of said offensive unit being ineffective to move said stationary offensive player simulations but effecting movement of the game object therebetween and therefrom.

4,249,745

RECORDING APPARATUS

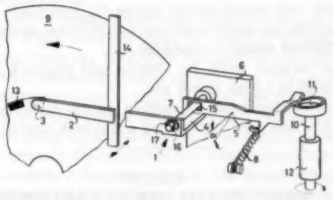
Berthold Dold, Schramberg, Fed. Rep. of Germany, assignor to Kienzle Apparate GmbH, Villingen, Fed. Rep. of Germany

Filed Mar. 19, 1979, Ser. No. 21,694

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1978, 2813849

Int. Cl.³ G11B *17/06*

U.S. Cl. 369—219 **12 Claims**



1. A recording device adapted for use with a planar record medium which is driven in a given direction under timed control comprising: a lever assembly having stylus means operatively mounted thereon for movement in the direction transverse to the given direction of travel of said record medium to effect recording thereon; axle means extending perpendicularly to the plane of said record medium having said lever assembly mounted thereon for movement relative thereto to effect recording movement of said stylus and to enable said stylus to be lifted from and applied against said record medium; first arm means formed as part of said lever assembly extending radially from said axle means having said stylus means opera-

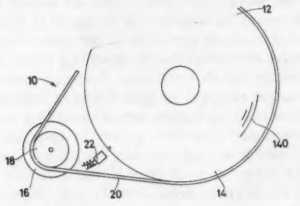
tively mounted thereon; second arm means extending radially from said axle means adapted to be actuated in accordance with information to be recorded on said record medium to effect movement of said stylus; a recording spring operatively engaged with said second arm means to apply a spring force thereto counteracting movement of said stylus; and means mounting said lever assembly upon said axle to enable rotational movement thereof about said axle to effect recording movement of said stylus and also to enable tilting movement thereof laterally of said axle to enable said stylus to be lifted from and applied against said recording medium.

4,249,746

TRACKING CONTROL FOR A VIDEO DISC PLAYER

Kazuo Mimasu, Soraku, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 26, 1979, Ser. No. 33,710
Claims priority, application Japan, Apr. 27, 1978, 53-50840
Int. Cl.³ G11B *21/04*
U.S. Cl. 369—221 **11 Claims**



1. A disc player system comprising:
support means for supporting a disc which carries information recorded thereon;
first motor means for rotating said support means;
first sensor means for detecting the number of rotations of said support means and developing an output in accordance therewith;
playback transducer means for reading out the information recorded on said disc;
drive means for shifting said playback transducer means on said disc;
second motor means having a rotatable drive shaft for activating said drive means;
second sensor means for detecting the number of rotations of said drive shaft and developing an output in accordance therewith; and
control circuit means responsive to said output from said first and second sensor means for selectively activating said second motor at at least two different modes, said two different modes comprising:
a fast rotation mode for shifting said playback transducer means at a high speed; and
a slow rotation mode for shifting said playback transducer at a low speed for performing a playback operation.

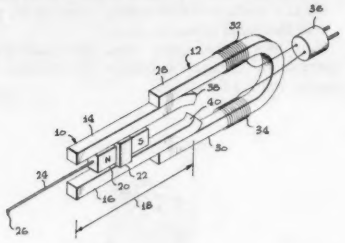
4,249,747

PHONOGRAPH PICK-UP CARTRIDGE

Benjamin B. Bauer, deceased, late of Stamford, Conn., and by Ida Bauer, executrix, 92 Red Fox Rd., Stamford, Conn. 06903

Filed Jul. 30, 1979, Ser. No. 62,015
Int. Cl.³ G11B *3/02*; H04R *11/12*
U.S. Cl. 369—136 **20 Claims**

1. For use in a phonograph tone arm having pick-up coil means associated with at least one pair of spaced sensing pole pieces, a replaceable stylus assembly comprising:
at least two longitudinally extending parallel stylus pole pieces formed of magnetically permeable material spaced apart to define a longitudinally extending pole gap therebetween,
a longitudinally extending elongated permanent magnet having first and second ends,
a stylus-containing shank connected to the first end of said elongated magnet,
mounting means connected to said stylus pole pieces for pivotally mounting said elongated magnet between said stylus pole pieces with the longitudinal axis of said elongated magnet extending parallel with said longitudinally extending stylus pole pieces,
said elongated magnet having a width which is only very slightly less than the width of said pole gap for defining at least two elongated narrow spaces between said elongated magnet and the respective stylus pole pieces,
thereby enabling said elongated magnet to pivot between



said stylus pole pieces in response to movement of said shank for causing the first and second ends of said elongated magnet to move toward and away from the respective pole pieces for varying the magnetic flux through said pole gap, and
said stylus pole pieces, said elongated magnet, said stylus-containing shank and said mounting means comprising a removable, replaceable stylus assembly with the surfaces of said stylus pole pieces opposite the end surfaces of said stylus containing shank being exposed and accessible for movement into abutting relationship with said sensing pole pieces,
whereby said stylus assembly can be conveniently removed and replaced as a unit without removing said sensing pole pieces and pick-up coil means from said tone arm.

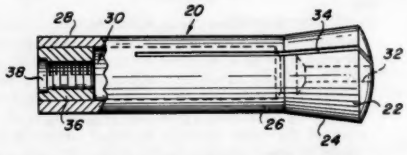
4,249,748

ONE-PIECE COLLET AND PROCESS FOR MAKING SAME

Earl C. Andrews, Elgin, S.C., assignor to Hardinge Brothers, Inc., Elmira, N.Y.

Division of Ser. No. 902,246, May 2, 1978, and a continuation-in-part of Ser. No. 675,688, Apr. 9, 1976, abandoned. This application Sep. 4, 1979, Ser. No. 72,722
Int. Cl.³ B23B *3/20*
U.S. Cl. 279—46 R **9 Claims**

PRIOR ART



1. A process for making a one-piece collet comprising:
(a) forming a tubular metallic blank having front, central and rear portions, the front portion having an exterior camming surface tapering towards said central portion, said central and rear portions having a longitudinal bore of substantially the same diameter, said rear portion having a wall substantially thicker than the central portion, so that

the outer diameter of said rear portion is greater, the transitional area between said rear and central portion of said tubular metallic being progressively and gradually increased in thickness from the central portion to the rear portion,

(b) cold forming said rear portion so as to reduce the outer diameter thereof and correspondingly reduce the diameter of the longitudinal bore of the rear portion, the transitional area between the central and rear portions being gradually and progressively increased in thickness, thereby providing a wall of smooth uniform grain flow with unbroken metal flow lines in the transitional area,

(c) drilling an axial bore through said front portion,

(d) forming a plurality of longitudinally extending slots in said front and central portions, thereby dividing said front and central portions into a plurality of leaves, and

(e) threading the bore of said rear section.

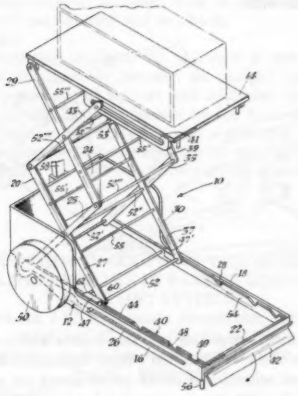
9. A collet produced by the process of claim 1.

4,249,749

MOBILE LIFT CART

Leroy Collier, 925 NE. 25th St., Belle Glade, Fla. 33430

Filed Mar. 1, 1979, Ser. No. 16,150
Int. Cl.³ B62B *3/00*
U.S. Cl. 280—35 **3 Claims**



1. An extendable mobile tool lift apparatus, comprising:

a base frame including wheel means for moving said apparatus over a surface, a support means for stabilizing said apparatus when in a stationary position, and a handle means for pivoting said apparatus off of said support means for movement on said wheel means;

two scissors-type linkage members mounted one on opposite sides of said base frame, a first lower end of each linkage member being pivotally connected to a fixed point on said base frame, a second lower end being constrained to slide in a guideway in said base frame;

bracing means connected between said linkage members for lateral support of said scissors-type linkage members;

a generally flat support means for bearing a load mounted on the upper end of said scissors-type linkage members generally parallel to said base means and extendable vertically above said base means by said scissors-type linkage members;

said scissors-type linkage members having a first upper end pivotally connected to a fixed point on said support means and a second upper end slidable in a guideway in said support means;

a foot releasable lower locking means pivotally connected to said base frame for holding said second lower end at a releasable position along said guideway in said base frame to vary the height of said support means, said foot releasable lower locking means attaching said locking means at a proximal end to said base frame, a plurality of engaging means for releasably holding said second lower end of said scissors-type linkage members along said guideway in said base frame, and a spring biasing means connected for biasing said locking means into engagement with said base frame; and

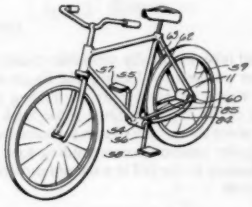
a guide means for guiding said second lower end of said scissors-type linkage members into engagement with said engaging means, said guide means slidably connected to said engaging means.

4,249,750

FLUID-POWER CONVERTER WITH PAIRED ROTATORS PROVIDING SEALS AND DISPLACEMENT PATHS AND PUMP-MOTOR UTILIZING SAME

Harold H. Kantner, 1112 Hinman Ave., Evanston, Ill. 60202

Filed Feb. 22, 1979, Ser. No. 13,844
Int. Cl.³ B62M *1/06*; F01C *1/08, 1/10*
U.S. Cl. 280—216 **20 Claims**



1. In a fluid-power converter which is a pump-motor,

a housing,

a chamber in the housing,

a quantity of fluid in the chamber,

a plurality of rotators in the chamber,

said rotators being in contact whereby to define a plurality of areas in the chamber,

one of said areas being a high-pressure area,

one of said areas being a low-pressure area,

at least one of said rotators having a smooth surface,

at least one other of said rotators having a gear-like surface,

a smooth rotator and a gear-like rotator being in rolling contact with each other to define a displacement path therebetween whereby said fluid may be transferred from one area to another area,

at least one pair of similar rotators in contact with each other to provide a seal between them whereby to restrict to a displacement path any fluid flow between the said areas.

12. In a fluid-power-converting system for a bicycle, a pair of pump-motors as defined in claim 1, one of said pump-motors being affixed to the pedals of the bicycle and the other of the pump-motors being affixed to a wheel of a bicycle, fluid-connections between the two pump-motor units to provide a fluid-circulating system, a by-pass valve in the system to permit free-wheeling and coaster-brake operation of the bicycle.

4,249,751

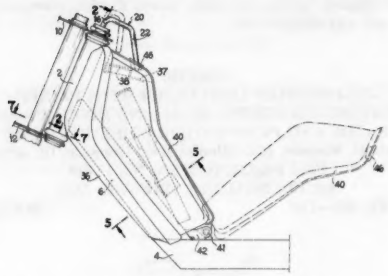
ANTITHEFT DEVICE FOR A MOPED

Bernard Lacroix, Montbeliard, France, assignor to Cycles Peugeot, Valentigney, France

Filed Sep. 12, 1979, Ser. No. 74,638
Claims priority, application France, Sep. 13, 1978, 78 26335
Int. Cl.³ B62H *5/06*; B60R *11/06*
U.S. Cl. 280—289 L **7 Claims**

1. An antitheft device for a moped which comprises a frame, a petrol tank mounted on the frame, a steering mechanism mounted on the frame and capable of being turned to the full in

either direction, and a lock for locking the steering mechanism when the steering mechanism has been turned to the full in a first direction, the steering mechanism including a steering tube and a pivot tube pivotable inside the steering tube, said device comprising a hood for covering the petrol tank and provided with an opening in an upper part of the hood, a hook forming a finger member for penetrating the opening of the hood and forming an axially slidable rod in the steering tube



and, inside said tube, elastically yieldable means for biasing the rod to a lower position for locking the finger member in the opening and means for precluding the raising of the rod and the unlocking of the finger member of the hook so long as the hook and the pivot tube of the steering mechanism are not each in a given angular position corresponding to a turning of the steering mechanism to the full in a second direction opposed to the first direction.

4,249,752

BRAKE FOR A SKI WITH A SAFETY-BINDING

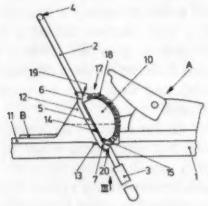
Hans Wehrli, Zürcherstrasse 81, Rapperswil, Switzerland

Filed Jan. 23, 1979, Ser. No. 5,796

Claims priority, application Switzerland, Jan. 31, 1978, 1013/78

Int. Cl.[3] **A63C** *5/00*

U.S. Cl. 280—605 **18 Claims**



1. A ski brake actuated by a ski boot for a ski having a safety binding, comprising

two guide cams each having a bearing portion at a lower end thereof and a contact surface adjacent to and above said bearing portion;

support means for mounting said guide cams over and beyond longitudinal edges of a ski;

two brake arms connected at upper ends thereof by a step rod and having brake spurs at lower ends thereof, said brake arms having contact portions and recesses immovably fixed on said brake arms, said recesses being adjacent and below said contact portions, said bearing portions being received in said recesses to mount pivotally said brake arms on said guide cams for movement between a skiing position in which said brake arms are generally parallel to the longitudinal edges of the ski and said arm contact portions are spaced from said contact surfaces and a braking position in which said brake arms are at an acute angle relative to the longitudinal edges of the ski and said arm contact portions engage said contact surfaces to stop pivoting movement of said brake arms; and

spring means for biasing said brake arms toward said braking position.

4,249,753

FRONT SET OF WHEELS FOR AN AUTOMOBILE VEHICLE

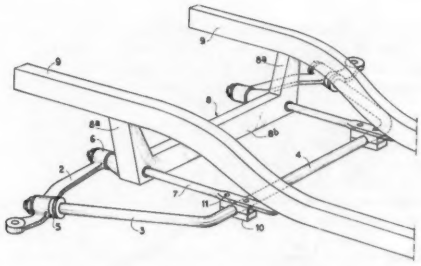
Armand Froumajou, Osny, France, assignor to Automobiles Peugeot and Societe Anonyme Automobiles Citroen, both of, France

Filed Mar. 7, 1979, Ser. No. 18,138

Claims priority, application France, Apr. 18, 1978, 78 11299

Int. Cl.[3] **B60G** *7/02*

U.S. Cl. 280—673 **4 Claims**



1. In a vehicle comprising two side-frames which are part of the stucture of the vehicle, and a front suspension comprising a set of front wheels and lower guide means for each front wheel, which guide means comprise for each wheel a transverse arm and an oblique arm interconnected by an articulation; the improvement wherein the side-frames each have an upwardly offset front portion and the lower guide means are supported by a support comprising a U-shaped cross-member which has a web portion and two branches upwardly extending from the web portion and is contained in a substantially vertical transverse plane spaced rearwardly from the transverse arms and from a vertical plane containing the axes or rotation of the front wheels and is disposed under said offset portions of the side-frames and fixed to the side-frames adjacent upper ends of said branches, two ties respectively connecting the cross-member to the side-frames, each tie extending rearwardly of the vehicle from the cross-member to a rear end portion of the tie and extending forwardly of the vehicle through and beyond the cross-member by a front end portion of the tie which forms a journal, on which journal the corresponding transverse arm is mounted to pivot about a substantially longitudinal axis, means mounting an end of the oblique arm remote from said articulation the corresponding side-frame to form a pivot longitudinally closely adjacent said rear end portion of the tie, and means fixing the rear end portion of each tie to the corresponding side-frame whereby each tie, said offset portion of the corresponding side-frame and the corresponding branch of the U-shaped cross-member form a rigid structure.

4,249,754

MOTOR-VEHICLE REAR-SEAT HEAD RESTRAINT

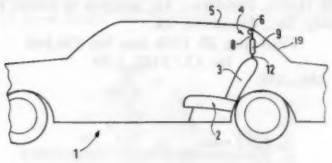
Carl M. Best, Steinhalde 69, 7800 Freiburg-Ebnet, Fed. Rep. of Germany

Filed Dec. 18, 1978, Ser. No. 970,143

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1977, 2757188

Int. Cl.[3] B60R *21/02*

U.S. Cl. 280—751 6 Claims



1. In combination with a vehicle having a rear seat having a seat back spaced below the vehicle roof and in front of a rear window, a head restraint comprising:

a pivot having a horizontal pivot axis adjacent and fixed relative to said roof above said rear seat;

a forwardly directed abutment fixed in said vehicle below said roof and adjacent said seat back;

a body; and

means mounting said body on said roof at said pivot for pivotal displacement between an upright use position bearing backwardly against said abutment, fixed above said seat back, and engageable by the head of a person sitting against said seat back, and a generally horizontal storage position immediately adjacent said roof and unengageable by the head of a person sitting against said seat back.

4,249,755

INPUT MOTION COUPLING TO A MOTION AMPLIFIER FOR USE IN PASSIVE SEAT BELT RESTRAINT SYSTEMS

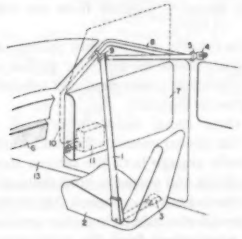
Juichiro Takada, 3-12-1 Shinmachi Setagayaku, Tokyo, Japan

Filed Apr. 27, 1979, Ser. No. 33,569

Claims priority, application Japan, Jan. 22, 1979, 54-4771

Int. Cl.[3] B60R *21/10*

U.S. Cl. 280—804 7 Claims



1. In a passive occupant restraint belt system for vehicles which includes a restraining belt, and apparatus for moving the belt from an occupant-restraining to an occupant-releasing position in response to opening of a door of the vehicle comprising belt transfer means engaging the belt for moving the belt from the restraining to the releasing position and motion transmission means coupled to the belt transfer means for transmitting and amplifying opening motions of the door to the transfer means, the transmission means including a motion amplifier mounted on either the vehicle body or door, and a linkage having one end attached to the other of the body and door and the other end coupled to an input component of the motion amplifier, the improvement wherein the linkage comprises a first link connected at one end to the other of said vehicle body and door, a second link carrying a lever adjacent one end and coupled adjacent its other end to said motion amplifier, and detent means for normally coupling said lever to said first link for transmitting door opening motion through said linkage to said motion amplifier and for releasing said lever from said first link for permitting relative movement between said first and second links in emergency situations when said amplifier or belt transfer means is inoperative.

4,249,756

PASSIVE SAFETY BELT ARRANGEMENT FOR VEHICLES, IN PARTICULAR PASSENGER AUTOMOBILES

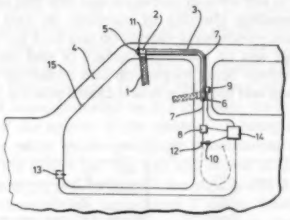
Wilfried Schwanz, Ahnsen, and Ulrich Seiffert, Braunschweig, both of Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed May 18, 1979, Ser. No. 40,440

Claims priority, application Fed. Rep. of Germany, May 20, 1978, 2822064

Int. Cl.[3] B60R *21/10*

U.S. Cl. 280—804 3 Claims



1. A passive safety belt arrangement for vehicles, for example passenger automobiles, comprising: a motor; a longitudinal actuating element that is strong in tension and compression and is capable of being driven by said motor in either longitudinal direction of said element; a traveler attached to one end of the safety belt and to the actuating element, said traveler being propelled along a track on the frame of the body of the vehicle by said actuating element between a release position and a restraint position for said belt; and a control system to control the motor, said control system including at least first and second limit switches indicating, respectively, when the traveler is in one of its two extreme positions, the first of said switches being arranged in the vicinity of the restraint position of said traveler at one end of the track and being actuable by a stud arranged on the actuating element adjacent the traveler, characterized in that the second limit switch, which indicates the release position of the belt and traveler, is at the same one end of the track as the first switch and is so arranged that when the traveler reaches the location corresponding to the release position of the belt, it is actuable by a stud arranged on the actuating element at a position remote from the traveler.

4,249,757

ART AND EDUCATIONAL BOOK

Teresa M. Gella, 328 Beard Ave., Buffalo, N.Y. 14214

Filed Nov. 22, 1978, Ser. No. 963,041

Int. Cl.[3] B42D *1/00*

U.S. Cl. 281—15 R 2 Claims

1. A book comprising:

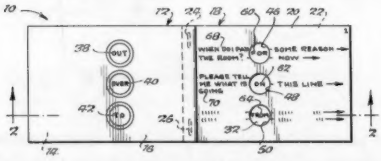
(a) a first page having front and rear surfaces, a last page having front and rear surfaces, and at least one additional page having front and rear surfaces, said pages meeting at a junction and being relatively movable about said junction;

(b) a component of graphical information in the form of a word on said back surface of said first page and another component of graphical information in the form of a word on said front surface of said last page;

(c) an opening in said additional page and located thereon such that when said additional page is moved to a position where said front surface of said additional page is adjacent said rear surface of said first page said word on said first page is visible through said opening and when said additional page is moved to a position where said rear surface of said additional page is adjacent said front surface of said last page said word on said last page is visible through said opening;

(d) components of graphical information in the form of groups of words on said front and rear surfaces of said additional page, said groups of words being arranged on said additional page relative to said opening such that when said additional page is moved to positions adjacent either said first or last pages said groups of words on said front or rear surfaces of said additional page are combined with either said words on said last or first pages, respectively, to convey graphical messages to the reader formed by the combination of said words and said groups of words;

(e) a plurality of additional components of graphical information in the form of words on said first and last pages, a corresponding plurality of openings on said additional page, said words being located on said back surface of said first page and on said front surface of said last page and said openings being located on said additional page such that when said pages are in said closed position said words



are visible through corresponding ones of said openings, and a plurality of other components of graphical information in the form of groups of words on said front and back surfaces of said additional page, said other groups of words being arranged relative to corresponding ones of said openings such that said words on said first and last pages and said groups of words on said additional pages associated with each of said openings are combined to convey a graphical message to the reader formed by the combination of said words and said groups of words;

(f) said words on said first and last pages being spaced apart along a direction disposed generally perpendicular to a line intersecting both eyes of the reader and said groups of words on said additional pages being disposed along a line generally parallel to a line intersecting both eyes of reader, said groups being spaced along a direction generally perpendicular to said line intersecting the eyes of the reader;

(g) a plurality of said additional pages each having a plurality of said openings therein, said openings on each of said additional pages being in registry with corresponding openings in the other of said additional pages so that said words on said first and last pages are visible through all of said openings when said additional pages are moved to positions adjacent said first or last pages; and

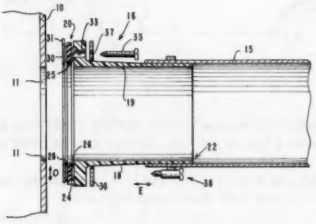
(h) components of graphical information in the form of groups of words on said front and rear surfaces of each of said additional pages, said groups of words being arranged on each additional page relative to said openings therein such that when each additional page is moved to positions toward either said first or last pages said groups of words on said front and rear surfaces of each additional page are combined with either of said words on said last or first pages, respectively, to convey graphical messages to the reader formed by the combinations of said words and said groups of words, said groups of words on said additional pages being disposed along a line generally parallel to a line intersecting both eyes of the reader, said groups being spaced along a direction generally perpendicular to said line intersecting the eyes of the reader.

4,249,758

DUCTWORK CONNECTING

Robert H. Harris, Jonesboro, Ak., assignor to Robert H. Harris Company, Inc., Jonesboro, Ak.

Filed Aug. 25, 1978, Ser. No. 936,848
Int. Cl.³ F16L *3/04*
U.S. Cl. 285—158 **8 Claims**



1. A method of connecting up a sheet metal main component and a branch component in a forced air heating and/or cooling system, utilizing a connecting component comprising an elongated tubular member having a passageway, and having a first end with an enlarged circumferential face generally perpendicular to the direction of elongation of the member, and a second end adapted to receive a branch component therearound, the first end face having an annular gasket of flexible material operatively affixed thereto, the gasket having an exterior face with glue thereon, and an annular section of release paper covering the glue, and the first end having plurality of openings extending therethrough, and through the gasket, generally parallel to the direction of elongation of the tubular member, said method comprising the steps of

(a) providing a generally circular opening in the sheet metal main component having substantially the same cross-sectional area and shape as the section of passageway in the elongated tubular member surrounded by the tubular member enlarged circumferential face;

(b) removing the release paper from the tubular member gasket;

(c) moving the tubular member into operative contact with the main component so that the gasket surrounds the opening in the main component and tubular member and main component together;

(d) passing sheet metal fasteners through the openings formed in the tubular member first end so that the fasteners operatively engage both the tubular member and the main component and securely hold them together; and

(e) bringing the branch component into operative airtight relationship with the tubular member second end, so that an airtight passageway from the main component to the branch component is provided.

4,249,759

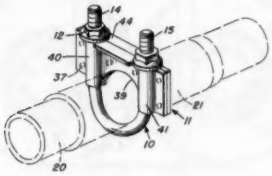
U-BOLT CLAMP

John E. Heckethorn, Dyersburg, Tenn., assignor to Heckethorn Manufacturing Company, Dyersburg, Tenn.

Continuation-in-part of Ser. No. 868,798, Jan. 12, 1978, Pat. No. 4,147,384. This application Jan. 8, 1979, Ser. No. 1,738
Int. Cl.³ F16L *13/14*
U.S. Cl. 285—382.2 **3 Claims**

1. In a clamp for sealing and interlocking a pair of telescoped

metal tubes to each other, said clamp comprising a U-bolt portion and a saddle member having a pair of U-bolt leg-receiving tubular parallel housings, said saddle member formed of a pair of substantially identical planar sheet metal webs welded together in face-to-face contact and having an arcuate cut-out portion of less than 180° extending between said tubular housings, the ends of the cut-out portion being chamfered outwardly to provide a large mouth opening, said cut-out portion having a relatively sharp edge; the improvement comprising said U-bolt portion having an arcuate bight portion having a radius the same as said arcuate cut-out portion of said saddle member and extending for less than 180°, short, cam portions of equal length and divergence angle extending from



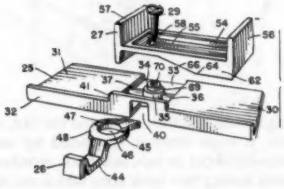
the ends of said bight portion and outwardly diverging therefrom, and parallel legs extending from the ends of said cam portions received in said tubular housings, said legs being threaded for reception of nut means, wherein a pair of telescoped tubes having an outside diameter that is greater than the inside diameter of the clamp when completely tightened about the tubes may be received by virtue of the opening between the U-bolt legs and the chamfered ends of the cut-out portion, said sharp edge of the cut-out portion and the inner surface of said bight portion cooperating when the clamp is in its completely tightened condition to form a continuously uniform circumferential bead on said telescoped tubes, due to progressive deformation of any areas not in contact with either said bight portion or sharp edge.

4,249,760

LATCH ASSEMBLY

James R. Conley, Wichita, Kans., assignor to The Coleman Company, Inc., Wichita, Kans.

Filed Jan. 5, 1979, Ser. No. 1,184
Int. Cl.³ E05C *3/10*
U.S. Cl. 292—197 **15 Claims**



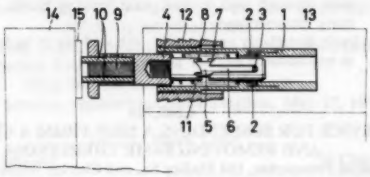
1. A latch assembly comprising a base, a knob movably mounted on the base for movement between a latched position and an unlatched position, a latch pivotally mounted between the base and the knob, the base including a fulcrum which engages the latch and about which the latch is pivotable, the latch having a generally V-shaped fulcrum portion which includes a trough portion which engages said fulcrum and a pair of cam-engaging portions which diverge from the trough portion, and cam means on the knob engageable with the latch for pivoting the latch into a latched position when the knob moves to its latched position and for pivoting the latch into an unlatched position when the knob moves to its unlatched position, said cam means including a first cam which is engageable with one of said cam-engaging portions of the latch when the knob moves to its latched position and a second cam which is engageable when the other of said cam-engaging portions of the latch when the knob moves to its unlatch position.

4,249,761

LOCKING ASSEMBLY FOR DOORS AND THE LIKE OF A BOX BODY

Tamotsu Nishimura, Osaka, Japan, assignor to Futaba Kinzoku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 30, 1979, Ser. No. 43,643
Int. Cl.³ E05C *17/56*
U.S. Cl. 292—251.5 **1 Claim**



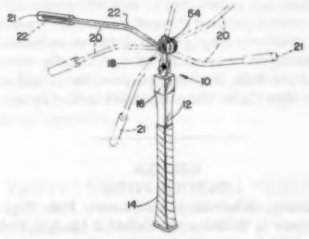
1. Locking assembly for doors and the like of a box body comprising a ring **2** provided in a predetermined position in a cylindrical body **1** so as to be rotatable in its circumferential direction, projections **3** being provided on the inner peripheral face of the ring **2**, a sliding rod **4** being fitted into the body **1** so as to be slidable in its axial direction, a concave groove **5** being formed on the peripheral face of the sliding rod **4**, serriform guides **7**, **8** being provided on the opposite walls thereof, the positions of the apexes of the guides **7**, **8** being shifted from each other, slide grooves **6** each communicative with the trough of the guide **7** at one end and closed at the other end being formed on the surface of the sliding rod **4** in the axial direction thereof, the projections **3** being fittable into the grooves **5**, **6**, a magnet **9** being mounted on the end of the sliding rod **4** opposite to the slide grooves **6**, a spring **11** for urging the sliding rod **4** toward the magnet **9** being provided in the body **1**.

4,249,762

ATHLETIC CLUB SWING TRAINING DEVICE

M. David Richards, 1595 N. Berenice Dr., Brea, Calif. 92621

Filed Apr. 9, 1979, Ser. No. 28,061
Int. Cl.³ A63B *69/36*
U.S. Cl. 273—193 A **2 Claims**



1. An exercising device adapted to be held in one's hand and used in a swing motion, said device comprising:

an elongated shaft wherein one end thereof is defined as a handle;

an elongated arm member having a free end and a fixed end rotatably coupled to said shaft;

a weight member removably secured to said free end of said shaft; and

coupling-joint means interconnecting said arm to said shaft,

whereby said arm is radially adjustable with respect to said handle;

securing means between said coupling-joint means and said shaft, whereby said coupling-joint means is secured to said shaft in a predetermined position;

wherein said coupling-joint means comprises:

a body member having said securing means adjustably mounted thereto;

a locking-block member supported on said body member, and having an opening formed therein;

a journal member adapted to be rotatably mounted to said locking-block member;

a threaded pin secured to one end of said arm and adapted to pass through said journal, said locking block, and said body member; and

a knob threadably engageable with said pin to lock said arm in any suitable angular position.

4,249,763

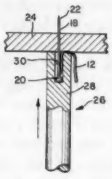
DEVICE FOR SUSPENDING A SIGN FROM A CEILING AND REMOVING SAME THEREFROM

Roland Provencher, 164 Hadley St., and Charles Williams, 1096 Boles St., both of New Bedford, Mass. 02745

Filed Dec. 31, 1979, Ser. No. 109,460

Int. Cl.³ A47F *13/06*

U.S. Cl. 294—19 R **9 Claims**



1. A device for suspending a sign from a ceiling in a display position and thereafter removing the sign from the suspended display position, wherein said sign includes a string, one end of which is attached thereto, and a pin having a head that is mounted on the other end of said string, comprising an elongated handle on one end of which means are located for receiving the head end of said pin therein and thereby exposing a substantial portion of the shank portion and the pointed end of said pin, whereafter said handle is lifted upwardly toward said ceiling to cause the pointed end of said pin to penetrate into said ceiling for insertion therein, whereupon movement of said handle downwardly leaves said pin frictionally mounted in said ceiling and said sign as attached to said string suspended therefrom in the display position thereof, and means secured to said handle for positively engaging said pin as mounted in said ceiling, whereupon movement of said handle downwardly extracts said pin from the inserted position in said ceiling to remove the sign from the suspended and display position thereof.

4,249,764

GARDEN FORK

Henning Gödeke, Schorndorf-Oberberken, Fed. Rep. of Germany, assignor to Wilhelm Abt GmbH & Co. KG, Fed. Rep. of Germany

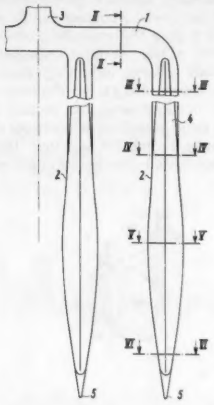
Filed Jul. 27, 1979, Ser. No. 61,316

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1978, 2836809

Int. Cl.³ A01B *9/00*

U.S. Cl. 294—55.5 **10 Claims**

1. Forged garden fork with a plurality of tines attached to a back, said tines tapering to points and being provided on their rear sides with a projecting section running lenghtwise, wherein a depression running lengthwise is forged into the front side of at least one of the tines, said depression starting adjacent the attachment of said tine of said back, becoming deeper and/or wider with increasing distance from the back in a manner causing the section modulus of said tine to decrease



inversely with distance from said back and then tapering and terminating at a point just before the tapered points of the respective tines.

4,249,765

ARRANGEMENT FOR HOLDING ROPES AND THE LIKE

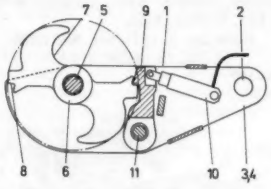
Hans-Georg Janssen, Bremerhaven, Fed. Rep. of Germany, assignor to Aktiengesellschaft "Weser" Werft Bremen, Bremen, Fed. Rep. of Germany

Filed Nov. 15, 1979, Ser. No. 94,663

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1978, 2851267

Int. Cl.³ B63B *21/04*

U.S. Cl. 294—84 **8 Claims**



1. A holding arrangement for ropes and the like, comprising support means; a hook member supported by said support means and rotatable about an axis, said hook member is formed as a double hook having two hook arms which are mirror-symmetrical relative to one another; and releasable locking means arranged for locking said hook member in a holding position.

4,249,766

BOTTLE SEPARATING AND CONNECTING BAND

Gerald Erickson, P.O. Box 747, Palm Beach, Fla. 33480

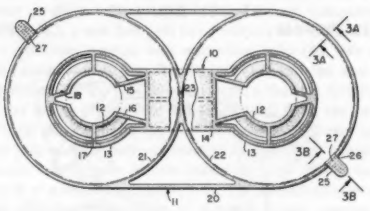
Filed Apr. 13, 1979, Ser. No. 29,716

Int. Cl.³ B65D *71/04*

U.S. Cl. 294—87.2 **1 Claim**

1. A bottle carrying apparatus for carrying bottles in a close, tight cluster comprising a carrier frame for engaging and locking together the cluster of bottles, bottle engaging means within the carrier frame for engaging the necks of the bottles and including a pair of spreadable release elements to permit a bottle to be removed from the frame by pivoting the lower end

thereof away from an adjacent bottle to force the neck of the bottle between said spreadable release elements, a bottle separating and connecting band for encompassing the cluster of bottles at a distance substantially below the carrier frame, a loop portion forming part of said band for encompassing a cluster of bottles, band portions integrally formed at opposite ends with said bottle encompassing loop portion and forming with parts of said loop portion individual retaining bands for each bottle, a bottle separator integrally connecting adjacent band portions to separate adjacent bottles, a plurality of pull tabs formed on said band for breaking the loop portion at



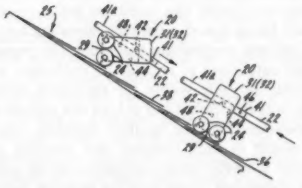
different locations to release selected bottles, a weakened portion in the band adjacent each pull tab to facilitate breaking the band, said band encompassing tapered surfaces of the necks of the bottles and said bottle engaging band portions being characterized in that the upper edges are thicker than the lower edges, and inner surfaces of the bottle engaging band portions tapered in substantially complementary fashion to the surfaces of the tapered portions of the bottles which they engage, the weakened portion adjacent each pull tab being of uniform thickness substantially less than the thicker upper edges of the band portions to facilitate breaking the band.

4,249,767

PORTABLE TOOLS FOR REMOVING SNOW FROM PITCHED ROOFS

Norman H. Andreasen, 3885 Gregory Dr., Northbrook, Ill. 60062

Filed Aug. 27, 1979, Ser. No. 69,877
Int. Cl.³ E01H *5/02*; A47L *13/02*
U.S. Cl. 294—19 R **6 Claims**



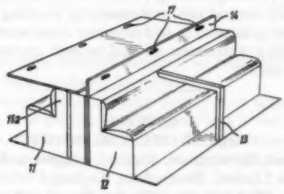
1. A portable tool for removing snow accumulations from the roofs of buildings comprising, in combination, a U-shaped body member having a horizontal bottom portion and two upstanding side flanges, roof engaging means mounted on said body member, handle means pivotally secured to said body member at a point centrally of said two upstanding side flanges and above said horizontal bottom portion for moving said tool upwardly and downwardly over the surface of said roof, first stop means mounted on said body member for engaging said handle means during movement of said tool upwardly over the roof for maintaining said horizontal bottom portion generally parallel to the roof during upward movement of said tool over the roof, said horizontal bottom portion and said two upstanding side flanges defining a U-shaped cutting edge for cutting a U-shaped channel in accumulated snow on the roof as said tool is moved upwardly over the roof, and second stop means mounted on said body member for engaging said handle means during movement of said tool downwardly over the roof and towards the roof edge for permitting said horizontal bottom portion of said U-shaped body member to pivot relative to said handle means into a position generally perpendicular to the roof during downward movement of said tool over the roof whereby said pivoted horizontal bottom portion plows the accumulated snow within the U-shaped channel off of the roof as said tool is moved downwardly by said handle means.

4,249,768

VEHICLES INCLUDING A MATERIALS SUPPORTING SURFACE ADAPTED FOR USE IN UNDERGROUND MINING OPERATIONS

Jack W. Bell, Bolton, England, assignor to Dobson Park Industries Limited, Colwick, England

Filed Oct. 18, 1978, Ser. No. 952,558
Claims priority, application United Kingdom, May 17, 1978, 20299/78
Int. Cl.³ B60N *1/00*
U.S. Cl. 296—63 **10 Claims**



1. In a vehicle particularly though not exclusively adapted for use in underground mining operations for the selective transportation of materials and carriage of personnel and including a seat structure thereon, the improvement comprising:

a materials supporting surface defined, at least in part, by a movable support platform means adjustable between first and second positions corresponding respectively to a materials transportation mode of operation and to a personnel carriage mode of operation, said platform means overlying said seat structure in the materials transportation mode of operation;

platform support means comprising a bar type member extending from said seat structure in its normal position transversely of the longitudinal direction of said seat structure, said bar type member having a generally horizontal support surface upon which the platform means rests in the material transportation mode of operation and;

wherein said seat structure comprises a pair of seats arranged in back-to-back relationship along the longitudinal axis of the vehicle and including a space therebetween for the storage of said platform means in the personnel carriage mode of operation.

4,249,769

PASSIVE RESTRAINT FOR A VEHICLE

Chester J. Barecki, Grand Rapids, Mich., assignor to American Seating Company, Grand Rapids, Mich.

Filed Jan. 15, 1979, Ser. No. 3,668
Int. Cl.³ B60N *1/02*
U.S. Cl. 296—65 A **17 Claims**

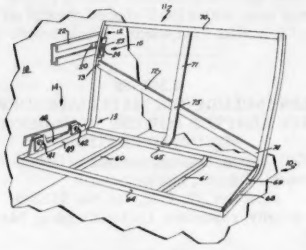
1. A passive restraint for a vehicle comprising:

a generally upright planar deflectable structure for receiving the impact of a passenger during an accident or a rapid maneuver, said deflectable structure including a top portion and a bottom portion;

first mounting means for securely mounting said bottom portion of said structure to the vehicle;

second mounting means for slidably mounting said top por-

tion of said structure to a sidewall of the vehicle, whereby said structure is free to deflect about said bottom portion of said structure to absorb the impact energy of a passenger thereby preventing or reducing serious injury to the passenger during an accident or rapid maneuver; and



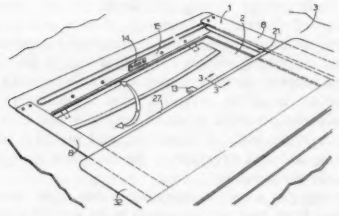
means for pivoting said top portion of said structure about a generally vertical axis, said means for pivoting preventing moments generated in said structure from interfering with the sliding movement of said second mounting means during impact.

4,249,770

VEHICLE OPENING ROOFS

Keith R. Hunt, Birmingham, England, assignor to Britax Weathershields Limited, Birmingham, England

Filed Feb. 22, 1979, Ser. No. 14,170
Int. Cl.[3] B60J 7/00
U.S. Cl. 296—218 **3 Claims**



1. A vehicle opening roof comprising a rectangular frame for surrounding a longitudinal opening in a roof of a vehicle, said frame comprising side members constituted by spaced parallel guide rails adapted to extend along each side of said opening, a front rail adapted to extend along the front end of said opening, and a rear rail adapted to extend along the rear end of said opening, a panel assembly guided between said guide rails, and a transverse mounting member slidably guided between said guide rails and incorporating a handle-operated locking mechanism for engagement with said front rail to lock said panel assembly in a closed position; said panel assembly being selectable from the group comprising:

a sliding panel together with an in-fill panel for closing the rear half of said frame, a sealing strip being provided between the edge of said panel and said side member of said frame; and

a flexible fabric covering, intermediate cross-members engaging at their ends with said guide rails, and a rigid flap at the forward end of said fabric covering, side edges of said fabric covering extending over, and in slidable engagement with, said roof of said vehicle on opposite sides of said opening;

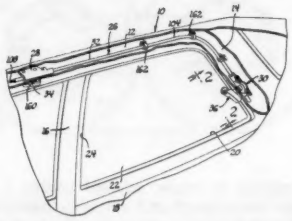
and said mounting member also incorporating a first bracket for detachable connection to said rigid panel, a second bracket for detachable connection to said rigid flap at the forward end of said flexible covering, and a transmission mechanism for connection to said flap and operable in synchronism with said handle-operated locking mechanism to draw said flap down into engagement with said roof of said vehicle at the front end of said opening.

4,249,771

MANUALLY OPERATED ACTUATOR ARRANGEMENT

Bela Gergoe, and Edmund F. Sarosy, both of Birmingham, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 16, 1979, Ser. No. 12,842
Int. Cl.[3] B60J 1/00
U.S. Cl. 296—146 **5 Claims**



1. A manually operated actuator arrangement for remotely effecting movement of a vehicle body component comprising, a pair of spaced actuators, one adapted to be mounted on the body adjacent the component and the other adapted to be mounted on the body remotely therefrom, each actuator including a pair of extensions and a passageway therethrough connecting the extensions, one extension being open and the other extension being closed, a conduit extending between the open extensions and cooperating therewith, the passageways, and the closed extensions to provide an enclosure, a flexible toothed member movable within the enclosure, cooperating means on the toothed member and at least one extension blocking rotary movement of the toothed member, gear means rotatably mounted in each actuator and meshing with the toothed member whereby rotary movement of one gear means effects linear translation of the toothed member and concurrent rotary movements of the other gear means, means connecting one gear means to an operator, and means connecting the other gear means to the vehicle body component.

4,249,772

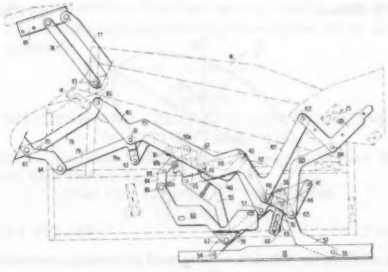
WALL-AVOIDING RECLINER CHAIR

Walter C. Rogers, Jr., P.O. Box 685, Denton, N.C. 27239

Filed Jul. 3, 1979, Ser. No. 54,956
Int. Cl.[3] A47C 1/02
U.S. Cl. 297—85 **7 Claims**

1. In a three-way wall-avoiding recliner chair including a base, a seat mounted relative to the base for movement between a normal position and a plurality of reclining positions located forwardly along the base from the normal position of the seat, a backrest mounted relative to the seat for movement

with the seat relative to the base between a normal generally upright position when the seat is in its normal position and a plurality of reclining positions located forwardly along the base from the normal position, said backrest also being pivotable relative to the seat for placing the chair into advanced reclining positions, armrests mounted to the seat for movement relative to the seat between a normal position when the seat is in its normal position, and an advanced position forwardly of its normal position, and a footrest mechanism mounted to the seat for movement between a retracted position adjacent the seat when the seat is in its normal position and an extended position projected forwardly from the seat when the seat is in a reclined position; an improved linkage system comprising a carrier link (**42**), a seat link (**40**) fixed relative to the seat, a pair of front and rear spaced seat mounting links (**43**, **44**) each pivotally connected to the carrier link (**42**) and the seat link (**40**) for mounting the seat link and in turn the seat relative to the carrier link with the seat link suspended from the carrier link, a front carrier mounting link (**50**) pivotally connected to the base (**10**) and pivotally connected to a forward portion of the carrier link, a rear carrier mounting link (**52**) pivotally connected at a lower end portion thereof to the base, an armrest link (**60**) fixed relative to an armrest, a rear armrest link (**59**) pivotally connected to the armrest link (**60**) and pivotally connected to an upper portion of the rear carrier mounting link (**52**), a drive transmission link (**65**) interconnecting the front



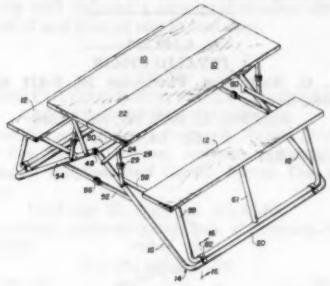
armrest mounting link (**64**) and the front carrier mounting link (**50**) to drive the front carrier mounting link when the armrest is moved from its normal position forwardly relative to the base, sequencing linkage means (**59***a*, **68**, **79**, **70**) connected to the rear seat mounting link (**44**) and the rear armrest mounting link (**59**) for preventing relative movement between the carrier link (**42**) and the seat link (**40**) when the footrest is moved from retracted position to extended position but thereafter permitting movement of the seat link relative to the carrier link for placing the seat into advanced reclining positions, a backrest linkage including a backrest link (**100**) fixed relative to the backrest and pivotally connected to a rear portion of the seat link (**40**), an other backrest link (**103**) pivotally connected to the first backrest link (**100**) and pivotally connected to the rear seat mounting link (**44**) for swinging the seat mounting links and in turn the seat link and the seat relative to the carrier link for placing the seat in advanced reclining positions after the footrest has been moved to extended position, said sequencing linkage means preventing pivoting movement of said other backrest link (**103**) and in turn the backrest relative to the seat until the footrest has been moved to extended position, a footrest linkage pivotally connected to the seat for moving the footrest between retracted and extended positions, a footrest actuating link (**90**) pivotally interconnected between the front carrier mounting link (**50***a*) and the footrest linkage to drive the footrest linkage forwardly from the seat when the armrest is moved forwardly from its normal position relative to the base.

4,249,773

FOLDING PICNIC TABLE

Joseph Giambalvo, 1118 Willoughby Ave., Brooklyn, N.Y. 11237

Filed Oct. 10, 1979, Ser. No. 83,953
Int. Cl.[3] **A47B** *3/14*
U.S. Cl. 297—159 **10 Claims**



1. A picnic table foldable between an open operative position and a closed position, comprising:

two U-shaped table legs each having two upper elements connected at the lower end thereof to a lower connecting element, the free ends of each said upper element of one leg being pivotably connected to the respective free ends of the other leg;

a center beam connecting the opposite connected ends of said table legs;

two folding leg braces each connecting opposite upper elements of said pair of table legs, each said leg brace being pivotable at a center pivot thereof and pivotably connected at the ends thereof to the respective upper elements of said table legs, said leg braces having locking means at their center pivots for locking said leg braces into a substantially horizontal position when the table is in an open position, said leg braces thereby forming closed triangles with the upper ends of the respective ones of said upper elements when in the open position;

two table leaves connectable at connecting edges thereof to form a horizontal table surface when the table is in the open position;

connecting means connected to said table leaves at the connecting edges thereof for connecting said table leaves when the table is in the open position;

four table supports, each of said table supports being pivotably connected at one end thereof to the underside of one of said table leaves at a corner opposite said connecting edge and pivotably connected at the other end thereof to the upper portion of one of said upper elements of said table legs;

four folding table braces each being pivotable at a center pivot thereof and pivotably connected at one end thereof to a respective one of said table supports and pivotably connected at the other end thereof to a respective one of said upper elements below the connection of the respective one of said table supports thereto, said table braces having locking means at their center pivots for locking said table braces into a substantially vertical position when the table is in an open position, said table braces thereby forming a closed triangle with the respective table supports and upper leg elements when in the open position;

two seat portions;

four seat supports each fixedly connected at one end thereof to the underside of one of said seat portions near a respective end thereof and each said seat support being pivotably connected at the opposite end thereof to a respective upper element of said table legs;

two U-shaped seat legs each having two upper members

connected at the lower end thereof to a bottom member, each free end of each said upper member being pivotably connected to the underside of the opposite ends of a respective one of said seat portions; and

clip means for releasably connecting each said bottom member of said seat legs to the respective one of said lower connecting element of said table legs.

4,249,774

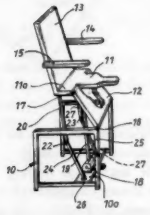
INVALID CHAIR

Sven A. G. Andreasson, Pianogatan 50, S-421 44 Västra Frölunda, Sweden

Filed Feb. 22, 1979, Ser. No. 14,288

Int. Cl.[2] A47C *1/02*

U.S. Cl. 297—311 **4 Claims**



1. An invalid chair for facilitating a sitting person to stand and a standing person to sit comprising: a floor-engaging base frame; an upright backrest; armrests carried by said backrest; a seat having a saddle portion connected to said backrest so as to extend forwardly and generally horizontally therefrom, said seat also having a generally U-shaped leg-supporting portion, the contour of the interior of the U being generally complementary to said saddle portion and the legs of the U pointing toward said backrest; means pivotally mounting the ends of the legs of the U about an axis fixed with respect to said backrest, such that said seat portion is swingable in a vertical plane relative to said backrest and saddle portion; and power means connected between said base frame and said backrest and saddle portion for raising and lowering said backrest and saddle portion relative to said base frame whereby said leg supporting portion swings between a first position generally coextensive with said saddle portion when said backrest and saddle portion are in a lowered position and a second position inclined downwardly and forwardly with respect to said backrest and saddle portion when said backrest and saddle portion are in a raised position.

4,249,775

MINING OF SULPHUR

Bohdan M. Zakiewicz, London, England, assignor to British Sulphur Corp., Ltd., London, England

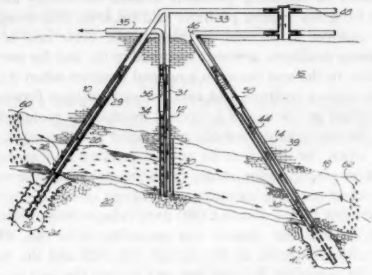
Filed Jan. 17, 1979, Ser. No. 4,198

Claims priority, application United Kingdom, Jan. 18, 1978, 2074/78

Int. Cl.[3] E21B *43/28*

U.S. Cl. 299—4 **11 Claims**

1. A method of mining sulphur from an underground deposit which overlays a soluble salt layer, wherein hot water or brine is passed down through at least one pressurising borehole which extends through the sulphur deposit into the underlying soluble salt layer thereby creating a superheated salt solution which is then directed into the sulphur deposit, brine is removed from at least one depressurising borehole at a location spaced from the pressurising borehole whereby the hot salt solution filters laterally from the pressurising borehole to the depressurising borehole through an intervening region of the sulphur deposit between said pressurising and depressurising boreholes and entrains molten sulphur in that region, and molten sulphur so formed is piped up to the surface from said



region through at least one production borehole located between the pressurising and depressurising boreholes.

4,249,776

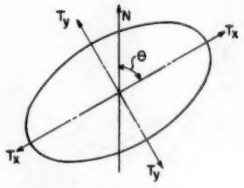
METHOD FOR OPTIMAL PLACEMENT AND ORIENTATION OF WELLS FOR SOLUTION MINING

David L. Shuck, and Calvin C. Chien, both of Littleton, Colo., assignors to Wyoming Mineral Corporation, Lakewood, Colo.

Filed May 29, 1979, Ser. No. 43,530

Int. Cl.[3] E21B *43/30*; E21C *41/14*

U.S. Cl. 299—4 **13 Claims**



1. A method for solution mining well placement comprising:

selecting an appropriate cell pattern;

selecting an appropriate cell area corresponding to said cell pattern;

determining the major and minor axes of transmissivity for the well field; and

installing said cell pattern so that the major axis of said cell is substantially parallel to the direction of said major axis of transmissivity.

4,249,777

METHOD OF IN SITU MINING

Roger J. Morrell; William C. Larson, both of Bloomington, and Robert D. Schmidt, Isanti, all of Minn., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jul. 24, 1979, Ser. No. 60,101

Int. Cl.[3] E21B *43/28*

U.S. Cl. 299—4 **4 Claims**

1. A method of in situ leach mining of a mineral bearing stratum comprising the steps of:

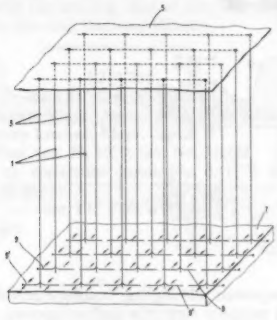
surface drilling a plurality of generally vertical leachant injection wells, said injection wells being horizontally spaced apart and aligned in a row;

surface drilling a plurality of generally vertical recovery wells, said recovery wells being horizontally spaced apart and aligned in a row substantially parallel to said injection wells, said injection and recovery wells each being drilled to a depth substantially equal to the depth of an aquiferrous mineral bearing stratum;

surface drilling at least two generally horizontal branch

wells from substantially the lowest point of each of said injection and recovery wells, said horizontal branches being parallel to one another and lying within a plane containing said stratum of minerals to be recovered each said branch including a screened section;

pumping a leachant fluid under pressure into said injection



wells to dissolve minerals contained in said mineral stratum; and

pumping said leachant containing said dissolved minerals out through said recovery wells, whereby said leached minerals are withdrawn from said mineral bearing stratum at a substantially constant rate over the lifetime of the mining operation.

4,249,778

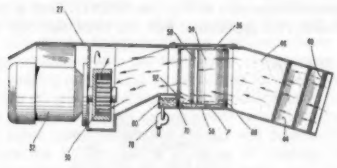
METHODS AND APPARATUS FOR REMOVING MOISTURE FROM AIR

Robert C. McGuire, Dublin, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 12, 1978, Ser. No. 950,548

Int. Cl.³ E21C *35/22*

U.S. Cl. 299—64 **2 Claims**



1. A mining maching comprising:

a body,

a driven cutter mounted on said body,

an air-cleaning system comprising duct means for conducting dust-laden air,

scrubber means for applying moisture to said dust-laden air, and

demisting means for thereafter removing moisture from the moistened air from said scrubber means, said demisting means comprising:

an in-feed duct having a floor,

an inlet opening to which wet air is delivered from said in-feed duct, and

an outlet opening located rearwardly of said inlet opening,

a plurality of upstanding louvers arranged to define passages for conducting wet air while moisture separates-out on the sides of said louvers and gravitates downwardly,

a collecting surface disposed beneath said louvers and upon which said moisture accumulates,

a moisture discharge located adjacent a rearward end of said collecting surface to remove rearwardly conducted moisture,

said collecting surface being substantially coplanar with said floor of said in-feed duct, and

a sump situated at a rearward end of said collecting surface and including a top wall defining a floor of a discharge duct communicating with said discharge opening,

said top wall disposed a substantial distance above the level of said floor of said in-feed duct.

4,249,779

ROTATING CUTTING DRUM HAVING TAPERED AND CURVED CONVEYING SURFACE

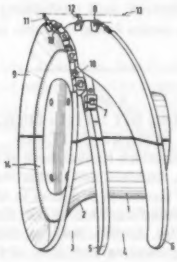
Gerd F. Best, Sprockhoevel, and Norbert B. Weikert, Dortmund, both of Fed. Rep. of Germany, assignors to Krampe & Co. Fertigung in Bergbaubedarf GmbH, Hamm, Fed. Rep. of Germany

Filed Apr. 27, 1979, Ser. No. 33,833

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1978, 2842131

Int. Cl.³ E21C *25/10*

U.S. Cl. 299—81 **20 Claims**



1. A cutting tool, particularly for a winning machine, comprising an elongated support having a front end adapted to face a working face of a material to be worked, a rear end axially spaced from said front end and adapted to face away from the working face of the same, and an outer circumferential surface extending between said front and rear ends, said outer circumferential surface including a portion adjacent to said front end and having a curved configuration which considerably diviates from a linear configuration, with an exterior dimension gradually decreasing in direction from said front end toward said rear end so that an exterior dimension of said portion at said front end is greater and an exterior dimensions of said portion at said rear end is smaller, to thereby provide for a reliable, simple and fast transportation of particles removed from the working surface of the material, in the direction from said front end toward said rear end of said support; and a plurality of cutting units located on said outer circumferential surface of said support along a line circumferentially embracing said support.

4,249,780

PRESSURE MEDIUM BRAKE SYSTEM FOR A VEHICLE

Herbert Mehren, Ludwigsburg, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 4, 1977, Ser. No. 774,541

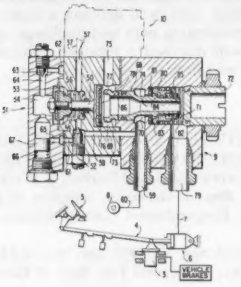
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1976, 2611355

Int. Cl.³ B60T *8/00*

U.S. Cl. 303—115 **44 Claims**

1. A pressure medium brake installation for vehicles, which comprises an electromagnetic control valve means for producing a brake control pressure that increases with an increase of the energizing magnitude of the electromagnetic control valve means, characterized in that the control valve means is opera-

ble to produce a pilot control pressure decreasing with an increase of the energizing current of the electromagnetic control valve means, and modulating converter means operable to supply an adjusting force dependent essentially on the differ-



ence between the pilot control pressure and an essentially constant comparison pressure and increasing with an increase of the energizing current, said modulating converter means including adjusting means being operable to adjust the brake control pressure.

4,249,781

ROTARY DRILLING BIT WITH CONICALLY SHAPED ROTARY CUTTERS

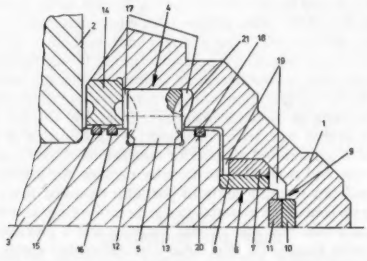
Armin Olschewski; Heinrich Kunkel, both of Schweinfurt; Manfred Brandenstein, Aschfeld, and Lothar Walter, Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Dec. 5, 1978, Ser. No. 966,668

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1977, 2755591

Int. Cl.[3] **F16C** *19/00;* **E21B** *4/02, 10/22*

U.S. Cl. 308—8.2 **6 Claims**



1. A rotary drill bit comprising a drill bit for minimizing lubricant leakage losses and for withstanding high operating temperatures body and at least one rotary cutter rotatably supported on the drill bit body by a plurality of load carrying bearing assemblies in a cavity between the rotary cutter and drill bit body, at least two seal member means in said cavity, one seal member means sealing said cavity from the outside environment and said other seal member means dividing said cavity into at least two discrete, enclosed chambers for preventing lubricant at the tip of the rotary cutter from being carried by centrifugal force toward the end of the rotary cutter facing the drill bit body, a load carrying bearing assembly in each chamber and a a different non-circulating lubricant in each of said separate chambers, said lubricants being suited for different running temperatures of the bearings in each chamber.

4,249,782

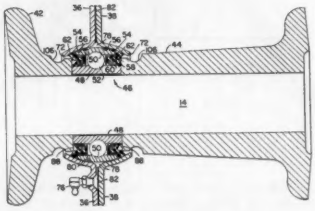
SELF-ALIGNING BEARING AND SEAL

William R. Frank, Moline, Ill., assignor to Deere & Company, Moline, Ill.

Continuation-in-part of Ser. No. 893,952, Apr. 6, 1978, abandoned. This application Sep. 11, 1979, Ser. No. 74,449

Int. Cl.[3] **F16C** *33/78*

U.S. Cl. 308—187 **35 Claims**



1. An improved self-aligning bearing assembly of the type adapted to rotatably support a shaft comprising: an inner race ring rotatably coupled with the shaft; anti-friction bearing means spaced circumferentially around the inner race ring; an outer race ring rotatably carried on the bearing means; a housing member supporting the outer race ring, said member and outer race ring slidably abutting at complementary surfaces of spherical cross section, the housing member having a side flange extending axially outwardly beyond the side of the outer race ring; and an annular resilient seal member carried by the outer race ring including a first seal lip extending radially inwardly and slidably engaging the outer surface of the inner race ring and a second seal lip extending axially outwardly and wipingly engaging the side flange of said housing member.

4,249,783

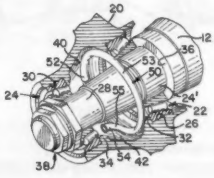
WHEEL HUB STRUCTURE WITH BEARING LUBRICATION

John J. Glassmeyer, Glenwood, Ill., assignor to Pullman Incorporated, Chicago, Ill.

Continuation-in-part of Ser. No. 838,517, Oct. 3, 1977, abandoned. This application Feb. 13, 1979, Ser. No. 11,826

Int. Cl.[3] **F16C** *33/66*

U.S. Cl. 308—187 **13 Claims**



1. A wheel hub structure rotatably carried by an axle and comprising

an annular hub housing adapted to be secured to a wheel;

said hub housing having a first inside bearing surface adjacent to an inner end of the hub housing and having a second inside bearing surface adjacent to an outer end of the hub housing;

inner and outer bearings between the axle and the respective first and second bearing surfaces to support the hub housing;

said hub housing having an annular lubricant reservior between the first and second bearing surfaces;

said annular lubricant reservior being formed radially outward relative to the inner and outer bearings; and

a tube having a first circumferentially extending portion

essentially subdividing said reservior and an inlet end aligned with the bottom of said annular lubricant reservior and having an outlet end directed toward at least one of said bearings for supplying lubricant to said one bearing, the circumferentially extending portion of said tube being positioned more closely to the other bearing than to said one bearing and thereby providing a lubricant entrapping channel with the housing open at one side to the other bearing for directing lubricant thereto.

4,249,784

BEARING ASSEMBLY

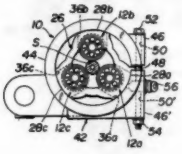
Michihiro Ichikawa, Kiryu, Japan, assignor to Ichikawa Iron Works Company Limited, Kiryu, Japan

Filed Aug. 30, 1979, Ser. No. 71,232

Claims priority, application Japan, Sep. 6, 1978, 53-108474; Apr. 20, 1979, 54-48848

Int. Cl.³ F16C *19/49*

U.S. Cl. 308—202 **49 Claims**



1. A bearing assembly for supporting an elongated rotary member rotatable about the center axis thereof, comprising, in combination, a stationary hollow casing, a bearing holder closely and detachably fitted in the casing and formed with a cavity having a center axis therethrough and including a central portion and at least three generally semicylindrical groove portions merging radially outwardly from the central portion, and bearing units positioned each in part in said semicylindrical groove portions, respectively, and substantially semicylindrically protruding each in part into the central portion of the cavity, each of the bearing units comprising a rotatable member having a circular cross section and rotatable in part through the central portion of the cavity and in part through each of said semicylindrical groove portions about an axis substantially parallel with the center axis of the cavity, and at least one bearing comprising an inner race member positioned on one side of said rotatable member and rotatable with the rotatable member, an outer race member radially spaced apart from the inner race member and closely and detachably fitted to said bearing holder, and a plurality of bearing elements rollably disposed between the inner and outer race members, the respective rotatable members of the individual bearing units being larger in diameter than the respective outer race members in the individual bearing units and forming therebetween an open space for passing said elongated rotary member therethrough so that the elongated rotary member is in rollable contact with the peripheral surfaces of the respective rotatable members of the bearing units and is retained in a position having its center axis substantially in alignment with the center axis of said cavity.

4,249,785

LABORATORY BENCH FOR HANDICAPPED STUDENTS

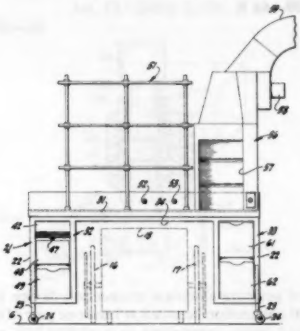
William W. Hapgood, Sacramento, and Wasyl Krimetz, Davis, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Feb. 21, 1979, Ser. No. 13,202

Int. Cl.³ A61C *19/02*; A47B *77/08*

U.S. Cl. 312—196 **5 Claims**

1. A laboratory bench for the handicapped comprising a framework including a pair of end pedestals separated in an amount to lie on opposite sides of a wheelchair disposed therebetween, a top extending across the top of said pedestals, vertically variable supports spacing said framework selected distances from the floor to locate said top above said wheelchair so disposed, a sink disposed in one of said pedestals and



open through said top, a hood enclosure disposed on said top over the other of said pedestals and having an opening directed toward an occupant of said wheelchair and toward said sink, a fume outlet connected to and extending from said hood enclosure, and a fan connected to said hood enclosure.

4,249,786

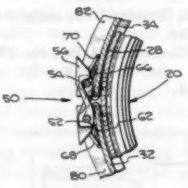
FLEXIBLE COUPLING

George A. Mahoff, Buena Park, Calif., assignor to Hydraflow Supply, Inc., Cerritos, Calif.

Filed Nov. 3, 1978, Ser. No. 957,652

Int. Cl.² H01R *3/04*

U.S. Cl. 339—15 **4 Claims**



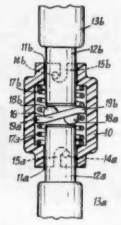
1. In a fixed cavity, integral bonded, flexible coupling for joining ferrule terminated tubing end means in an aircraft, a clam shell coupling means for releasably encircling the outer dimensions of said tubing end means and joining said tubing end means together in flexible sealed relationship, said clam shell coupling means including two semicircular segments hingedly joined together for movement between open and closed configurations; spring means for biasing said segments toward said open configuration; and means for latching said segments together in said closed configuration, said means for latching including a first latch pin carried by a first of said segments and a second latch pin carried by a second of said segments, at least one latch pawl pivotally mounted on each of said latch pins, a latch pawl pivotally mounted on said first latch pin being engageable with said second latch pin and a latch pawl pivotally mounted on said second latch pin being engageable with said first latch pin, said latch pawls being spring biased toward engagement with the respective latch pins.

4,249,787

NOVEL END-PRESSURE CONNECTION DEVICE

Prosper Welu, Le Plessis Trevise, France, assignor to S.E.P.M. Societe d'Exploitation des Procedes Marechal, Paris, France

Filed Mar. 26, 1979, Ser. No. 24,279
Claims priority, application France, Apr. 4, 1978, 78 10098
Int. Cl.³ H01R *21/28*
U.S. Cl. 339—64 R **10 Claims**



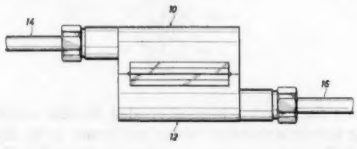
1. An end pressure electrical connection device for making an electrical connection between at least one pair of contacts in pin form, said device comprising an insulating box, at least one intermediate bar arranged in said box for each pair of pins to be placed in electrical contact, each pair of pins being axially aligned in their connecting position, said bar for each pair of pins being formed of a conductive material, each of the surfaces of said bar being provided with a contact stud adapted to become applied in electrical contact with one end of said pins in connecting position, said studs being arranged on both sides of the common axis of said pair of pins, at least one spring arranged in said box concentrically around said pair of pins when said pins are in a connecting position thereby urging the ends of said bar so that said bar takes an inclined position relative to an initial position of said bar before the pins are connected, whereby each stud is under pressure in electrical contact with the end of the corresponding pin.

4,249,788

WATERPROOF MULTIPLE WIRE CABLE CONNECTING DEVICE

William O. McNeel, Houston, Tex., assignor to Mark Products, Inc., Houston, Tex.

Filed Dec. 26, 1978, Ser. No. 972,792
Int. Cl.³ H01R *4/00*
U.S. Cl. 339—94 M **11 Claims**



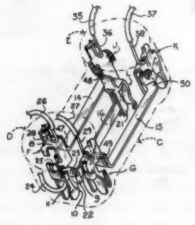
1. A waterproof multiple wire electric cable connecting device comprising, a pair of connector assemblies, each assembly including a housing having an open side bounded by the side and end walls of the housing, at least two opposite walls of the housing having shoulders with outwardly facing surfaces located below the outer edges of the walls, a face plate assembly extending across the open side of the housing in engagement with the outwardly facing surfaces of the shoulders, said face plate assembly including a male pin connector and a female socket connector in side-by-side relationship to mate with a female connector assembly, seal means for combining with the seal means of the other connector assembly to seal the connectors and the open side of the housing from the ambient environment when the two connectors are assembled, said sealing means comprising a body of elastomeric material positioned on the face plate assembly with openings therein through which the male and female connectors extend, said body extending laterally over the shoulders and having a thickness such that it will be compressed between the shoulders and the face plate assemblies of the two connector assemblies into sealing engagement with the side and end walls of the housing, the connectors, and the other sealing means when the pair of connector assemblies are assembled, and means to connect the two assemblies and to compress the seal means.

4,249,789

TWIN ELECTRIC SOCKETS FOR OUTLET BOX

Hop Lee, 2455 - 24th Ave., San Francisco, Calif. 94116

Filed Apr. 23, 1979, Ser. No. 32,544
Int. Cl.³ H01R *13/20, 13/50*
U.S. Cl. 339—156 R **2 Claims**



1. In combination:

(a) a base supporting a first socket and a second socket with each socket having three front openings;

(b) each socket having three back recesses communicating with said front openings for slidably receiving three electrodes;

(c) a first electrode mating with and mounted in a first recess in the first socket and a second electrode mating with and mounted in a first recess in the second socket, said base having a first side slot for receiving a first bus bar with laterally extending ends that electrically interconnects the two electrodes at least one of said electrodes having a projection thereon engaging the outside of an end of said first bus bar for locking the bar in position;

(d) a third electrode mating with and mounted in a second recess in the first socket and a fourth electrode mating with and mounted in a second recess in the second socket, said base having a second side slot for receiving a second bus bar with laterally extending ends that electrically interconnects said third and fourth electrodes at least one of said third and fourth electrodes having a projection thereon engaging the outside of an end of said second bus bar for locking the bar in position;

(e) a first ground electrode mating with and mounted in a third recess in said first socket and a second ground electrode mating with and mounted in a third recess in the second socket, said base having a third slot extending between said third recesses in the two sockets and through an end of one socket;

(f) a third bus bar adapted to be slid into the third slot for electrically interconnecting the two ground electrodes;

(g) said third bus bar having an integral loop at one end dimensioned to receive and tightly engage a tongue that is integral with said first ground electrode for making an electrical connection therewith, said third bus bar having the other end thereof dimensioned for frictional gripping by a yoke that is integral with the second ground electrode and forming an electrical connection therewith; and

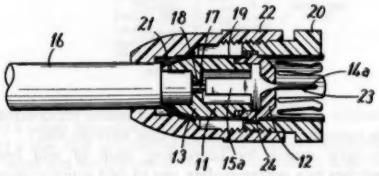
(h) first and second caps threaded on the back of said first and second sockets for retaining the electrodes therein.

4,249,790

COAXIAL CABLE CONNECTOR PLUG

Katsuo Ito; Bunjiro Murata, both of Kanazawa, and Kazunori Yoshimura, Ishikawa, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Aug. 15, 1979, Ser. No. 66,561
Claims priority, application Japan, Aug. 22, 1978, 53-115571
Int. Cl.[3] H01R 17/04
U.S. Cl. 339—177 E 11 Claims



1. A coaxial cable connector plug for electrically connecting a coaxial cable including a center conductor, an inner insulation covering said center conductor, and an outer conductor, to a connector receptacle having a receptacle opening, said connector plug comprising:

a connection member including a contact portion being electrically connected to said center conductor of said coaxial cable, and a pin portion being electrically connected to said contact portion and being adapted to be electrically connected to said connector receptacle;

said contact portion and said pin portion of said connection member being integrally made of a single metallic plate, said contact portion being formed at one longitudinal end of said metallic plate and said pin portion being formed at the other longitudinal end of said metallic plate, an engaging portion being further formed in said connection member at a position intermediate said contact portion and said pin portion and protruding in a direction orthogonal to the longitudinal direction of said connection member;

said engaging portion comprising two layered engaging pieces facing each other and formed by folding said single metallic plate;

an inner casing made of an insulating material and receiving said contact portion of said connection member, said inner casing comprising first and second portions, said first portion including a first aperture for guiding said center conductor of said coaxial cable into the inside of said inner casing, at least one of said first portion and said second portion having a groove formed therein, said groove receiving said engaging portion of said connection member, and a second aperture formed in said second portion, said pin portion extending through said second aperture and outside said inner casing;

a shield casing made of a conductive material for covering said inner casing, said shield casing having openings formed at both ends thereof, one opening of said shield casing being adapted to receive said inner insulation of said coaxial cable; and

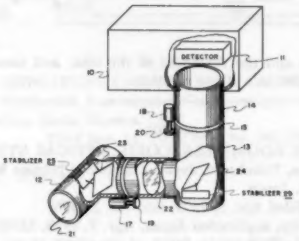
connecting/fixing means for electrically connecting and fixing said outer conductor of said coaxial cable to said shield casing.

4,249,791

OPTICAL SCANNING SYSTEM USING FOLDING MIRRORS AND WITH STABILIZATION

David P. Helm, Burke, and William S. Flogaus, Alexandria, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 7, 1979, Ser. No. 18,380
Int. Cl.[3] G02B 23/00
U.S. Cl. 350—16 5 Claims



1. An optical scanning and stabilization system having a detector for an image and having an optical axis and including:

an objective with at least first and second lens elements on said axis;

a first fully reflective plane mirror on said axis between said lens elements, the plane of the mirror being non-perpendicular to said axis;

a second fully reflective plane mirror on said axis between said objective and said detector, the plane of said second mirror being non-perpendicular to said axis and non-parallel to the plane of said first mirror, wherein said optical axis includes a first segment between the center of said first mirror and the center of said second mirror and a second segment between the center of said second mirror and said detector;

a first housing surrounding and supporting said first lens element and said first mirror;

a second housing surrounding and supporting said second lens element and said second mirror;

means for pivotably supporting said first housing on said second housing whereby said first housing is rotatable about said first axis segment;

means for pivotably supporting said second housing with respect to said detector whereby said second housing is rotatable about said second axis segment; and

further including means for stabilizing at least one of said mirrors to provide stabilization of an image on said detector.

4,249,792

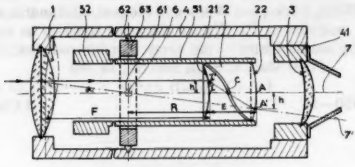
OPTICAL OBSERVATION INSTRUMENT WITH FIBER OPTIC IMAGE STABILIZER

Jacques Moirez, Paris, France, assignor to Societe d'Optique, Precision Electronique et Mecanique Sopelem, Paris, France

Filed Mar. 21, 1979, Ser. No. 22,512
Claims priority, application France, Apr. 3, 1978, 78 097290
Int. Cl.[3] G02B 23/00, 5/17
U.S. Cl. 350—16 5 Claims

1. An optical observation instrument comprising a mounting, a convergent objective lens and a convergent eyepiece supported in said mounting, a bearer frame integral with a disc of optical fibers arranged so as to provide on the output face an image reversed with respect to the incident image on the input face, a gimbal type articulation connecting said bearer frame and disc to said mounting, the front face of said disc being substantially at the focus of said objective lens, said articulation

being located in front of said disc at a distance substantially equal to half the difference between the focal length of the



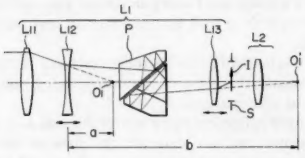
objective lens and the thickness of the disc, and means for retaining the disc in a stable position.

4,249,793

ERECT TYPE ZOOM TELESCOPIC OPTICAL SYSTEM

Makoto Uehara, Yokohama, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Apr. 5, 1979, Ser. No. 27,485
Claims priority, application Japan, Apr. 7, 1978, 53/40235
Int. Cl.³ G02B *15/18*; B02B *25/00*; G02B *23/00*
U.S. Cl. 350—43 **8 Claims**



1. An erect type zoom telescopic optical system comprises:
(a) a positive lens group positioned nearest to an object side and movable along the optical axis for focusing;
(b) a variator group positioned next to the positive lens group and movable along the optical axis for varying magnification;
(c) a compensator group positioned at the image side of the variator group and movable interlocking with the variator group along the optical axis for forming an image of the object at a predetermined definite position;
(d) an image erecting prism member positioned between the variator group and the compensator group for erecting the image;
(e) a field stop positioned at said definite position where the image of the object is formed; and
(f) an eye-piece for observing the image of the object formed at said field stop.

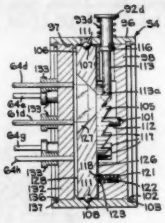
4,249,794

OPTICALLY COUPLED REMOTE CONTROL SYSTEM

Frank P. Haley, Upland, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Mar. 21, 1979, Ser. No. 22,409
Int. Cl.³ G02B *5/16*
U.S. Cl. 350—96.20 **15 Claims**

1. Apparatus for using light signals to control the operation of an articulated loading arm comprising:
a light source;
a plurality of optical fibers;
a plurality of optical switches, one of said optical switches including: a reflective prism, means for mounting a first end of said prism adjacent one end of a first one of said optical fibers means for mounting one end of a second end of said optical fibres adjacent a second end of said prism, a knife blade, means for pivotally mounting said knife blade between said prism and the end of said second optical fiber, and means for pivotally moving said knife blade away from the end of said second optical fiber to provide a path for light to pass between said prism and the end of said knife blade;
means for connecting said fibers between said light source and a corresponding one of said optical switches;



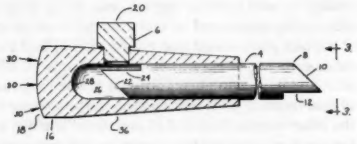
a plurality of light-operated actuator means for controlling the operation of a plurality of load devices; and
fiber optic means for connecting each of said optical switches to a corresponding one of said actuator means.

4,249,795

SCOPE FOR VIEWING THE INTERNAL SURFACE OF A BORE OR SIMILAR CAVITY

Ira D. Jones, 1023 S. Main St., South Bend, Ind. 46601

Filed Mar. 28, 1979, Ser. No. 24,695
Int. Cl.³ G02B *5/14*
U.S. Cl. 350—96.26 **11 Claims**

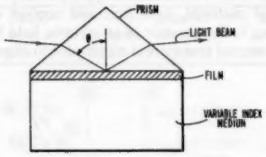


1. A scope for viewing the internal surface of a bore or similar cavity comprising a rod formed of optically clear material having a head, a viewing surface, a shank, and an image transmitting end; said head having a light gathering end with a light gathering surface; said head having an internally formed cavity with a first cavity surface and a second cavity surface; said first cavity surface defining an internal optical surface extending obliquely to the axis of said rod; said viewing surface disposed oppositely to said internal optical surface; said viewing surface generally paralleling the axis of said rod; said head having a surface portion extending toward said shank wherein image producing light incident upon the light gathering surface of said head is transmitted by said surface portion into said shank and toward said image transmitting end; said second cavity surface defining means for directing image producing light incident thereupon toward said surface portion of the head and into said shank to said image transmitting end; said image transmitting end defining means for directing said image producing light transmitted therein toward and onto said cavity surface with the image of said cavity surface produced thereby being directed by the image transmitting end onto said internal optical surface of the head; said internal optical surface defining means for reflecting said image through said viewing surface.

4,249,796
PROJECTION DISPLAY DEVICE

Glenn T. Sincerbox, and Joseph G. Gordon, II, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 21, 1979, Ser. No. 50,590
Int. Cl.³ G02F *1/01*
U.S. Cl. 350—376 **8 Claims**

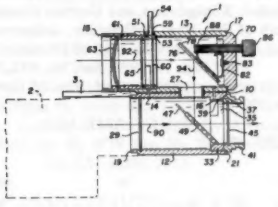


1. A projection display device comprising:
(a) a prism having a base;
(b) a thin film of material having a negative dielectric constant and having one side in optical contact with the base of said prism, and a second side;
(c) a medium of variable refractive index in contact with said second side of said film;
(d) means to pass a beam of light which is plane polarized in the plane of incidence onto the base of said prism at an angle to excite a surface electromagnetic wave at the interface between said medium and said film; and
(e) means to vary the refractive index of said medium.

4,249,797
DUAL IMAGE VIEWER WITH MIRROR ADJUSTING MEANS

Steve Sendecki, 11257 - 64th Ave., Delta, British Columbia, Canada (V4E 1C3)

Filed May 24, 1979, Ser. No. 42,334
Int. Cl.³ G02B *27/14*
U.S. Cl. 350—174 **13 Claims**

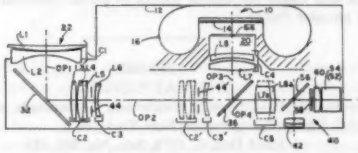


1. A dual image viewer comprising:
a first enclosure having a first entrance for admitting light, a first optical path for light and a first exit for light;
a second enclosure having a second entrance for admitting light, a second optical path for light and a second exit for light, the second optical path intersecting the first optical path near the second exit;
a semireflective mirror interposed along the first optical path where the second optical path intersects the first optical path, so that at least a portion of the light entering the first entrance is transmitted through the surface towards the first exit and at least a portion of the light entering the second entrance is reflected by the surface and deflected generally along the first optical path towards the first exit;
a second mirror within the second enclosure for reflecting the light entering the second enclosure towards the first optical path;
the second mirror being at an angle with the second optical path, the viewer including means for changing the angle to vary the position on the semireflective mirror where light from the second optical path strikes and thereby varying the position of light from the second optical path leaving the first exit, said means for changing the angle comprising means hingedly connecting the second mirror to the second enclosure and a thumb screw threadedly received in the rear end of the second enclosure and contacting the second mirror; and
a mount for mounting the viewer on an infrared scanner so that a visual image converted from an infrared image by the scanner enters the first entrance and a corresponding visual image enters the second entrance, producing two coincident or adjacent images visible through the first exit.

4,249,798
MINIATURE CAMERA WITH ZOOM LENS

Jacob Moskovich, Los Angeles, Calif., assignor to Vivitar Corporation, Santa Monica, Calif.

Filed Sep. 11, 1978, Ser. No. 941,516
Int. Cl.³ G02B *15/18*
U.S. Cl. 350—423 **14 Claims**



10. An optical system for a camera having a substantially rectangular housing substantially enclosing a zoom lens defining an optical axis with a light ray entrance through one side of the housing to form an image at a film plane in the housing, said plane arranged perpendicular to a portion of the optical axis;
the zoom lens comprising four lens groups, a first negative group being axially movable to focus the lens, a second positive lens group and a third negative lens group, said second and third groups being axially movable to vary the equivalent focal length of the lens, and a fourth positive lens group;
means twice folding the optical axis of said lens between said first and second lens groups and between said third and fourth lens groups;
an aperture defining means located between said second and third lens groups; and
a shutter means located in front of the film plane;
said lens satisfying the following relationships:

$0.3 \leqq |F_A/FVD| \leqq 0.5$
$0.1 \leqq F_B/FVD \leqq 0.2$
$0.1 \leqq |F_C/FVD| \leqq 0.4$
$0.3 \leqq F_D/FVD \leqq 0.5$
$F_A < 0$
$F_D/BFL \geqq 2.4$

where F_A, F_B, F_C and F_D are equivalent focal lengths of the four groups from the object to the image end, respectively; FVD is the front vertex distance of the lens, and BFL is the back focal length of the lens.

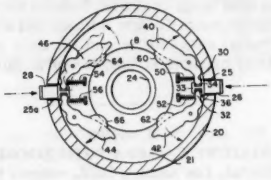
4,249,799
CONNECTOR FOR OPTICAL DEVICES

Jose J. Iglesias, Elizabeth, N.J., assignor to The Iglesias Trust, Elania Iglesias, Trustee

Filed Apr. 27, 1979, Ser. No. 34,152
Int. Cl.³ G02B *7/00*; F16D *1/10*; F16B *21/06*
U.S. Cl. 350—257 **1 Claim**

1. A device for connecting two separate parts, particularly in the field of optics, comprising a circular plate having a central opening and an annular flange, a plurality of pairs of levers positioned internally of the flange, each of the levers being pivotally mounted on the plate at points radially outside the

central opening, a detent means on the inner end of each lever, which is that most adjacent the central opening in the plate, resilient means engaging the outer end of each lever of each pair and constantly urging the levers of each pair to their positions in which the detent means are in their innermost positions, and a plurality of buttons each of which is slidably



mounted in the annular flange between the outer ends of the levers of a pair of levers with their inner ends engaging the outer ends of the levers and their outer ends external to the flange for manual depression, whereby depression of the buttons will cause the detent means to move outwardly toward the annular flange.

4,249,800

DISPLAY DEVICE

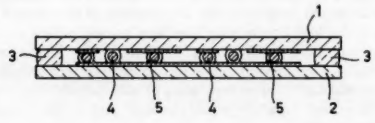
Aloysius M. J. M. Spruijt, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 4, 1978, Ser. No. 966,454

Claims priority, application Netherlands, Dec. 22, 1977, 7714232

Int. Cl.³ G02F *1/133*

U.S. Cl. 350—320 **2 Claims**



1. A method of making a display device with two support plates spaced apart by grains of a hard material having uniform diameters enveloped by a thermoplastic envelope comprising the steps of suspending the grains in a photosensitive lacquer on one of the plates, exposing the photosensistive lacquer to radiation through a patterned mask, developing the exposed photosensitive lacquer, whereby the grains are present only in the locations corresponding to the pattern of the mask, and pressing the plates together with the grains therebetween while raising the temperature of the thermoplastic envelopes to a temperature sufficiently to soften the same.

4,249,801

LIQUID CRYSTAL DISPLAY DEVICE

Sadao Masubuchi, Musashino, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Filed Oct. 25, 1978, Ser. No. 954,596

Claims priority, application Japan, Oct. 28, 1977, 52/129330

Int. Cl.³ G02F *1/13*

U.S. Cl. 350—346 **4 Claims**

1. A liquid crystal display device comprising:

a first transparent substrate;

a first transparent electrode formed on a surface of said first transparent substrate;

a second transparent substrate;

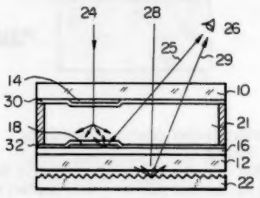
a partially reflecting dichroic mirror formed on a surface of said second transparent substrate;

a second transparent electrode formed on a surface of said partially reflecting dichroic mirror;

a first alignment layer formed over said first transparent electrode and over areas of said surface of said first transparent substrate outside areas which are covered by said first transparent electrode;

a second alignment layer formed over said second transparent electrode and over areas of said partially reflecting dichroic mirror outside areas which are covered by said second transparent electrode;

a layer of liquid crustal molecules consisting of a mixture of positive dielectric anisotropy liquid crystal molecules and chiral material, said first and second alignment layers acting in the absence of an electric field between said first and second transparent electrodes to align the longitudinal



axes of molecules of said liquid crystal layer adjacent thereto in a direction parallel to the plane of said first and second substrates whereby said liquid crystal molecules attain a Grandjean texture, with the helix axes of said Grandjean texture being aligned substantially normal to said substrate plane, said liquid crystal layer being responsive to an electric field of predetermined strength between said first and second transparent electrodes for assuming a focal conic texture wherein incident light passing through said liquid crystal layer is scattered thereby; and

diffusion reflection means arranged on the opposite side of said second transparent substrate to said layer of liquid crystal molecules.

4,249,802

OPHTHALMOLOGICAL INSTRUMENT

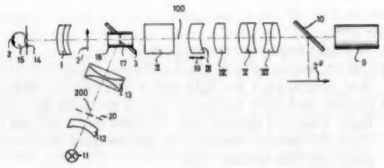
Franz Muchel, Königsbronn, and Gunther Sümmerer, Oberkochen, both of Fed. Rep. of Germany, assignors to Carl Zeiss-Stiftung, Oberkochen, Fed. Rep. of Germany

Filed Sep. 14, 1978, Ser. No. 942,217

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1977, 2741992

Int. Cl.³ A61B *3/14*

U.S. Cl. 351—7 **8 Claims**



1. Ophthalmological instrument for examining and photographing the fundus of the eye, said instrument comprising means forming an illuminating beam path and an observation beam path, said observation beam path having, successively in a direction from the eye (**15**) of a patient to be examined toward the eye of a person making the examination, an objective (I) for producing an inverted magnified flattened image (**2'**) of the fundus (**2**) of the eye being examined, a perforated mirror (**3**) through a perforation in which the observation beam path extends, a reflecting prism (II), a lens group (III) for focusing said image (**2'**) at infinity, further lens groups (IV, V, VI) for producing an erect image (**2''**) of the fundus of the eye, and an observation tube (**9**), said illumination beam path in-

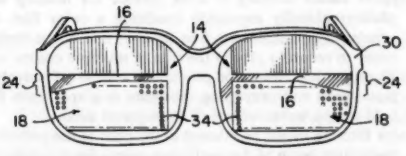
cluding a source of light (**11**), a collector (**12**), and a lens group (**13**) for focusing said source of light into the pupil (**14**) of the eye of the patient via said perforated mirror (**3**), at said objective, prism, and lens groups in said observation beam path having characteristics substantially within a tolerance range of plus or minus five percent of the numerical values indicated in the following table, the respective symbols having the meanings explained in the accompanying specification:

Lens	Radius (R)	Thickness (D)	Air space (S)	Index of refraction n_d	Abbe number V
			$S_1=40$		
	$R_1=13.050$				
		$D_1=7.0$		$n_{d1}=1.522489$	$\nu_1=59.48$
I	$R_2=31.623$				
		$D_2=4.8$		$n_{d2}=1.522489$	$\nu_2=59.48$
	$R_3=88.486$				
			$S_2=99.5$		
	$R_4=$ Plane				
II		$D_3=43.0$		$n_{d3}=1.51680$	$\nu_3=64.17$
	$R_5=$ Plane				
			$S_3=17.0$		
	$R_6=57.461$				
III		$D_4=3.5$		$n_{d4}=1.76180$	$\nu_4=26.95$
	$R_7=139.24$				
			$S_4=15.3$		
	$R_8=143.30$				
IV		$D_5=3.5$		$n_{d5}=1.76180$	$\nu_5=26.95$
	$R_9=$ Plane				
			$S_5=13.8$		
	$R_{10}=17.783$				
		$D_6=8.5$		$n_{d6}=1.51680$	$\nu_6=64.17$
V	$R_{11}=-25.119$				
		$D_7=3.1$		$n_{d7}=1.784701$	$\nu_7=26.08$
	$R_{12}=27.582$				
			$S_6=5.8$		
	$R_{13}=-19.81$				
		$D_8=2.0$		$n_{d8}=1.522489$	$\nu_8=59.48$
VI	$R_{14}=20.684$				
		$D_9=8.5$		$n_{d9}=1.582670$	$\nu_9=46.47$
	$R_{15}=-25.3$				
			$S_7=130.3$		

4,249,803
OPTICAL DEVICE FOR PRE-OPERATIVE CATARACT PATIENTS

William H. Byler, 804 Village La., Winter Park, Fla. 32792, assignor to William H. Byler and Thelma T. Byler, both of Sarasota, Fla., Trustees of William H. Byler Revocable Trust

Filed Jul. 10, 1979, Ser. No. 56,269
Int. Cl.³ G02C *7/16*
U.S. Cl. 351—46 **9 Claims**

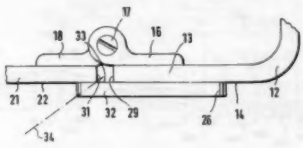


1. An improved optical device in combination with means for holding the device in position before the eye, said optical device including an opaque mask for mounting before the eye, a horizontal transparent area extending substantially across the mask at eye level, an array of discrete circular transparent areas on the mask, the array being disposed below the horizontal transparent area and each circular area having equal diameters of between 0.5 and 1.2 mm. is characterized by an increase in the total aperture of the transparent areas on those portions of the opaque mask where both the eye-to-mask distance and angular spacing from a straight-ahead line of sight increases substantially thereby permitting a clearer field of vision and improved clarity while limiting the influx of light.

4,249,804
SPRING HINGE FOR SPECTACLES

Kurt Stohrer, Lerchenweg 18, 7030 Boblingen, Fed. Rep. of Germany

Filed Jun. 8, 1979, Ser. No. 46,707
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1978, 2825711
Int. Cl.³ G02C *5/14*
U.S. Cl. 351—121 **3 Claims**



1. A spring hinge for spectacles, having lense frames, a stay bar which points rearwardly from the edge of the frame and has an outer surface; a spectacle arm in extension of the stay bar, which likewise has an outer surface; a hinge provided on the inside of the stay bar and the spectacle arm which connects the spectacle arm and the stay bar and which has a swivel axis; a rearwardly pointing front face on the stay bar and a front face on the spectacle bow pointing forwards in the open position of the spectacle arm; comprising the following improvements:

(a) the front faces are spaced apart from one another in the open position of the spectacle arm;

(b) a leaf spring is provided which is spaced from the swivel axis of the hinge and extends on both sides of the front faces and has a fastening area in one of its end regions, by which it is rigidly connected to one of the outer surfaces;

(c) at the other end region the inside surface of the leaf spring is adapted to touch the other outer surface in the swivel position of the spectacle arm corresponding to the desired open position; and

(d) this other outer surface is composed of metal.

4,249,805
COMPOSITE PHOTOGRAPHY SYSTEM

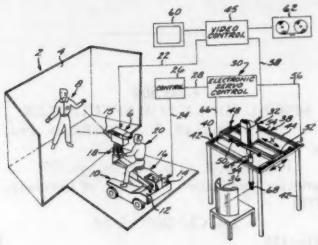
Robert S. Hilbert, La Canada; Darryl E. Gustafson, Altadena; Thomas I. Harris, Pasadena, and Matthew P. Rimmer, Claremont, all of Calif., assignors to Magicam, Inc., Hollywood, Calif.

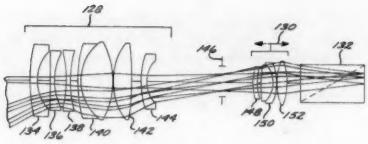
Filed Mar. 26, 1979, Ser. No. 23,591
Int. Cl.³ G03B *21/32*
U.S. Cl. 352—85 **54 Claims**

1. In a composite photography system of the registered matte type having foreground and background camera optical systems and objects constituting a reference frame for each camera optical system in a scene in the field of view of each camera, the size of the objects in the background scene being on a scale different from that of objects in the foreground scene and means for coordinating the movement of each camera optical system, the improvement comprising;

a substantially stationary entrance pupil position being maintained in respectively the foreground and background optical systems during a focusing mode of operation, and means for maintaining a substantially constant magnification

ratio of image to object during a variable focussing of at least one of the foreground and background optical systems whereby the composite registration scale of the foreground and background objects are maintained.





4,249,806

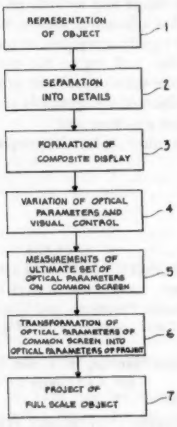
METHOD AND SYSTEM OF DESIGNING A PROJECT

Joseph Tokhadze, 21 W. 86th St., Apt. 1501, New York, N.Y. 10024

Continuation-in-part of Ser. No. 896,391, Apr. 14, 1978, abandoned. This application Sep. 26, 1979, Ser. No. 79,301

Int. Cl.[3] G03B *15/00, 33/06, 21/26*

U.S. Cl. 353—30 **10 Claims**



1. A method of designing of project, such as a structural exterior or interior, motion picture, stage or television set or the like, comprising the steps of

forming a plurality of detail images representing details of said project in miniature form;

projecting said detail images on a common screen so as to superimpose them and to thereby produce on said common screen a composite display of said project in miniature form;

varying parameters including colors of the projections of said detail images, independently and separately from one another to impart to said composite display different sets of optical parameters to thereby produce a plurality of composite displays with different sets of optical parameters and to thereafter select one of said composite displays with an ultimate set of optical parameters on said common screen;

transforming said set of optical parameters from said common screen by laws of transformation into corresponding parameters of the full scale project, said transforming step including transforming in accordance with the following formula:

$$B^k_{OR}/B_{bR}=1-(B^k_{OM}/B_{bM}-1),$$

wherein

$B_{OR}{}^k$ and B_{bR} are brightnesses of K object and background of a full scale project, respectively,

$B_{OM}{}^k$ and B_{bM} are brightnesses of K object and background, on a model or screen, respectively, and

M is a transformation constant; and

producing the full scale project from the thus-transformed parameters so as to obtain the full scale object with ultimate set of optical parameters for the same.

4,249,807

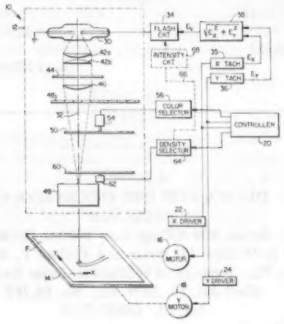
COLOR PLOTTING DEVICE AND METHOD

Ronald B. Webster, Ellington, and Ronald P. Larsen, Vernon, both of Conn., assignors to The Gerber Scientific Instrument Company, South Windsor, Conn.

Filed May 14, 1979, Ser. No. 38,452

Int. Cl.[3] G03B *41/00*

U.S. Cl. 354—4 **30 Claims**



1. A color plotter comprising:

support means defining a work surface for holding in a photographically exposable condition a color film discriminately photosensitive to light of different colors in order to record a plot in the film in multiple colors:

light projecting means for producing a beam of polychromatic light and projecting the beam as a spot onto film held on the work surface of the support means;

color filtering means positioned in the path of the polychromatic light beam of the projecting means for adjusting the color of the light spot projected on the film, the color filtering means including a plurality of color separation filters of different spectral transmission characteristics and means for moving the filters respectively and selectively into and out of the polychromatic beam of light to thereby change the color of the light spot on the film and the color recorded in the film; and

displacement means connected with the support means and the light projecting means for controllably moving the colored light spot and film relative to one another and thereby expose the color film with the light spot in differ-

ent colors at different locations to record a plot in multiple colors.

25. A method of generating a plot in different colors comprising:

providing a color film having a surface photosensitive to light of different colors and capable of recording and reproducing with discrimination images in different colors;

generating a beam of light and directing the beam onto the photosensitive surface of the color film to expose the film;

moving the beam of light from one location of the photosensitive surface to another to expose images of a plot on the surface at different locations; and

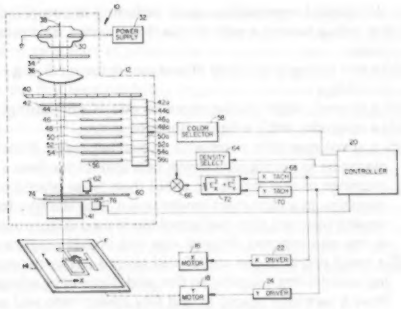
changing the color of the beam of light between the exposure of the film at the one location and the other to record images of the plot in the film in different colors at the different locations.

4,249,808

PHOTOPLOTTING IN COLOR WITH EXPOSURE BUDGETING

Ronald B. Webster, Ellington, Conn., assignor to The Gerber Scientific Instrument Company, South Windsor, Conn.

Filed Aug. 10, 1979, Ser. No. 65,558
Int. Cl.³ G03B *41/00*
U.S. Cl. 354—4 **21 Claims**



1. A method of plotting with exposure budgeting comprising:

generating a spot of radiant energy on the photosensitive surface of a color film having emulsion layers variously sensitive to exposure by the color-defining components of the spot of radiant energy;

moving the spot of radiant energy and the color film relative to one another with prescribed motions to cause the spot to move to different positions on the photosensitive film surface and expose the desired plot on the film;

changing the color-defining components of the radiant energy in the generated spot to expose different colors in the photosensitive emulsion layers in the color film at different positions over which the spot is moved; and

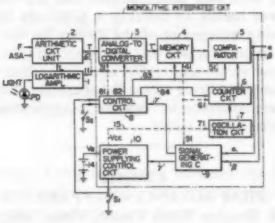
limiting the exposure of the film emulsion layers by the color-defining components at positions of the plot where the generated spot exposes the color film more than once with the same or different colors to prevent over-exposure of any one of the emulsion layers in the color film.

4,249,809

AUTOMATIC CONTROL CIRCUIT SYSTEM FOR CAMERAS PROVIDED WITH A FOCAL-PLANE SHUTTER HAVING FRONT AND REAR SCREENS

Kenji Kanemaru, Chiryu, and Takashiroh Iwasaki, Tokyo, both of Japan, assignors to Hitachi, Ltd., Japan

Division of Ser. No. 923,197, Jul. 10, 1978, Pat. No. 4,187,018.
This application Jul. 26, 1979, Ser. No. 61,070
Claims priority, application Japan, Jul. 18, 1977, 52/85061
Int. Cl.³ G03B *7/093*
U.S. Cl. 354—23 D **6 Claims**



1. An automatic control circuit system for cameras provided with a shutter mechanism, a calculation circuit for calculating an amount of electricity to comprise electric information corresponding to photographing conditions with reference to a measured light value and the sensitivity of the film, and a photographing means for photographing in accordance with said photographing conditions, wherein said automatic control circuit generates a control signal for controlling said shutter mechanism to end the exposure of the film,

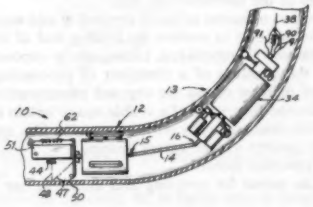
characterized in that said automatic control circuit system further includes a memory circuit for memorizing the electric information corresponding to said photographing conditions, and that a system resetting signal is generated in accordance with a change in the wave form of said control signal after the control signal ends of the exposure of the film so as to erase said electric information memorized by said memory circuit.

4,249,810

PIPELINE INSPECTION APPARATUS

Donald T. O'Connor, Barrington; Donald E. Lorenzi, Des Plaines; John J. Flaherty, Elk Grove Village, and Edward Schaefer, Bellwood, all of Ill., assignors to Magnaflux Corporation, Chicago, Ill.

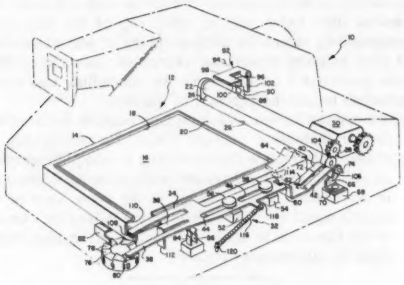
Filed Feb. 27, 1978, Ser. No. 881,148
Int. Cl.³ G03B *37/00*
U.S. Cl. 354—63 **3 Claims**



1. In pipe inspection apparatus, a device arranged to be inserted into a pipe for longitudinal movement therewithin, photographic camera means carried by said device including film storage and transport means arranged for feeding film through an image area and optical means for projecting to said image area an image from an internal surface area of the pipe,

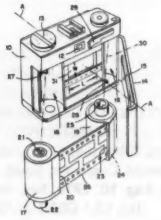
illumination means for illuminating said internal surface area of the pipe, and operating means for operating said film storage and transport means and said illumination means during movement of said device along the pipe for recording on the film a sequence of images of the internal surface of the pipe, drive means including drive wheel means for engagement with the inside surface of the pipe and motive power means for rotating said drive wheel means to move said device along the pipe, connection means for connecting a tether to said device for withdrawal of said device from the pipe independently of said drive means, said drive means being operable between a drive condition wherein said drive wheel means are in pressure engagement with said inside surface and are coupled to said motive power means to develop a relatively high frictional force opposing movement of the device by the tether and a release condition in which said frictional force is reduced to a relatively low value, and means interconnecting said connection means and said drive means for operating said drive means to said release condition in response to application of a predetermined force by the tether.

4,249,811
FILM ADVANCING APPARATUS
Lawrence M. Douglas, South Easton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Mar. 2, 1979, Ser. No. 17,056
Int. Cl.[3] G03B *17/52*
U.S. Cl. 354—86 **5 Claims**



1. Photographic apparatus for use with a film assemblage of the type including a film cassette having means defining an egress opening in one end thereof, an ingress opening, and an exposure aperture, and a plurality of thin self-developing type film units located within the cassette with a foremost one of the film units being adapted to be urged into a position wherein its photosensitive area is located adjacent to and in alignment with the exposure aperture and a leading end of the film unit is located in position to be moved through the egress opening, said photographic apparatus comprising:
means for supporting the film cassette in position for the exposure of the foremost film unit;
a pair of rollers mounted adjacent one end of said supporting means in position to receive the leading end of the foremost film unit therebetween, subsequent to exposure, and spread the contents of a container of processing liquid mounted thereon across the exposed photosensitive area to initiate the formation of a visible image within the film unit while simultaneously withdrawing the film unit from the film cassette via the egress opening;
a battery powered motor;
transmission means for coupling said motor to one of said rollers;
first normally open switch means adapted, when closed initially, to connect said motor with a battery so as to enable said one roller to be rotated by said transmission means;
indexable means for indicating the number of unexposed film units in the film cassette; and
an elongate member mounted adjacent said supporting means for reciprocal movement from a first position to a second position and back to said first position during an exposure cycle, said elongate member including first, second and third extensions which during movement of said elongate member from said first to said second position are adapted to, respectively, enter the ingress opening in the film cassette and engage the foremost film unit and advance it into engagement with said rollers, close said first normally open switch before the foremost film unit engages said rollers, and index said indexable means so as to indicate the number of unexposed film units remaining in the film cassette, and during movement back to said first position said second extension facilitates the opening of said normally open switch.

4,249,812
DOUBLE FORMAT STILL CAMERA
Jon F. Hall, 4649 Atoll Ave., Sherman Oaks, Calif. 91243
Filed Nov. 29, 1979, Ser. No. 98,642
Int. Cl.[3] G03B *1/00, 13/10, 17/02*
U.S. Cl. 354—120 **3 Claims**



1. A double format still camera, including in combination:
(a) a casing having a rear access door with a film pressure plate;
(b) a first cavity in one side of said casing for receiving a film cartridge;
(c) a second cavity on the opposite side of said casing;
(d) a magazine with a lightproof film slot;
(e) a spool manually receivable in and separable from said magazine to permit attachment of a film leader from a film cartridge to said spool, the spool then being placed in the magazine in a light-tight environment with the film leader passing into said slot, said spool having a driving coupling at one end exposed through one end of said magazine;
(f) a spool driver in one end of said second cavity for engaging said driving coupling so that said film can be advanced from a cartridge placed in said first cavity onto said spool in said magazine in said second cavity;
(g) an advancing lever on said casing coupled to said spool driver, said magazine and cartridge having substantially identical exterior dimensions such that said magazine and cartridge can be turned upside down and interchanged in said first and second cavities respectively so that said spool driver in said one end of said second cavity will register with and couple to the drive coupling for the spool in said cartridge normally used for rewinding purposes;
(h) a lens on the front of said casing; and,
(i) an aperture in said casing on the optical axis of said lens, said aperture having a width dimension as measured vertically no greater than one half the width of a film in said cartridge and a given length dimension running horizontally in the direction of advancement of said film, said first and second cavities supporting and positioning said film cartridge and magazine such that only the top half of said film registers with said aperture whereby after said film has been advanced from said cartridge into said magazine to expose the top half thereof, said magazine and cartridge

with the end portion of said film still extending from said cartridge can be turned upside down as an assembly and the magazine received in said first cavity and the cartridge received in said second cavity, advancing of the film permitting the lower half of the film to be exposed until all of the film has been received into the cartridge so that advancement of the film from the magazine into the cartridge serves to simultaneously rewind the film as well as permit a second series of exposures on the lower half of the film to take place resulting in the provision of twice as many pictures with the same horizontal length as can be provided with conventional cameras.

4,249,813

FIXTURE FOR ELECTRONIC FLASH

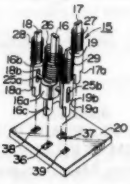
Takahiro Nihei, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 25, 1979, Ser. No. 60,339

Claims priority, application Japan, Aug. 1, 1978, 53/106385[U]

Int. Cl.³ G03B *15/03;* H01R *27/00*

U.S. Cl. 354—128 **8 Claims**



1. A fixture for electronic flash comprising a body including a connection member which is adapted to be detachably mounted on a shoe of an associated camera, a first connection terminal and a second connection terminal disposed within the body, the first terminal being utilized to enable a synchronized flashlight illumination from an electronic flash and the second terminal being used to transmit an electrical signal to a camera which is indicative of the completion of a charging operation or the completion of a flashlight illumination of an electronic flash, and a terminal retracting member disposed in the body for causing a movement of the second terminal away from the shoe to disable the electrical connection thereof when the fixture is mounted on a shoe which is not provided with a connection terminal adapted to mate with the second connection terminal of the fixture.

4,249,814

FRUSTRATED TOTAL INTERNAL REFLECTION CAMERA SHUTTER

John R. Hull, and Malvern K. Iles, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Oct. 1, 1979, Ser. No. 80,382

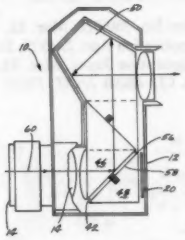
Int. Cl.³ G03B *9/08, 19/12*

U.S. Cl. 354—154 **14 Claims**

1. In a camera having a camera body associated with a lens system for receipt of light and images to be photographically recorded, a view finder for viewing what the lens system receives, a film holder used in recording images on film, and a shutter interposed between the lens system and the film holder, the improvement comprising,

a frustrated total internal reflection shutter having at least two refracting prisms which are movable with respect to each other from light reflecting, open or gapped positions to light transmitting, or closed, surface contact positions, the surfaces of said prisms defining first and second gaps between said prisms, each of said gaps being independently movable with respect to the other,

the first gap being interposed between the lens system and the film holder to control light transmission to the film, and



said second gap being interposed between the lens system and the view finder to control light transmission between the lens system and the view finder.

4,249,815

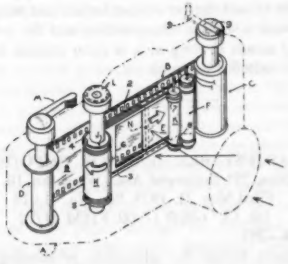
CAMERA WITH MEANS FOR ALLOWING PHOTOGRAPHY UNDER LOW LIGHT CONDITIONS

Nelson D. Burkholder, 604 Reasor Dr., Virginia Beach, Va. 23464

Filed Apr. 30, 1979, Ser. No. 34,395

Int. Cl.³ G03B *9/28, 9/40, 19/00*

U.S. Cl. 354—241 **34 Claims**



1. A camera comprising:

(a) a film plane area in the camera, including an imaging area;

(b) means for exposing the imaging area to imaging light;

(c) an auxiliary non-imaging light source movably positioned in the camera;

(d) means for causing the movable auxiliary light source to move across said imaging area;

(e) whereby a film in the film frame area may be given a uniform increment of exposure to light in addition to the imaging light.

4,249,816

PHOTOGRAPHIC CAMERA WITH A RELEASE LOCKING DEVICE

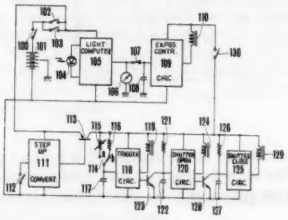
Masayuki Suzuki, Kawasaki; Tadashi Ito, Yokohama; Masayoshi Yamamichi, Kawasaki, and Hiroyasu Murakami, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 780,018, Mar. 22, 1977, Pat. No. 4,178,085. This application Apr. 2, 1979, Ser. No. 26,215

Claims priority, application Japan, Mar. 31, 1976, 51-35739

Int. Cl.[3] **G03B** *7/083, 17/38*

U.S. Cl. 354—266 **1 Claim**



1. A camera having an electromagnetic shutter release device and comprising:

connecting means for a battery;

a photometric circuit including photographic information display means;

a shutter release control circuit having a shutter release button;

a first switch disposed between said shutter release control circuit and said connecting means to close said shutter release control circuit in response to depression of a shutter release button;

a preview member;

a second switch connected between said photometric circuit and said connecting means and arranged to be closed by the preview member;

an operating member independent of said shutter release button; and

a third switch connected between said connecting means and said first and second switches, the third switch being arranged to be operated by said operating member independent of said shutter release button and being arranged to prevent a shutter release action and the action of said display means as long as it is open despite the first and second switches being closed.

4,249,817

ADJUSTABLE HEAD FOR TRIPODS

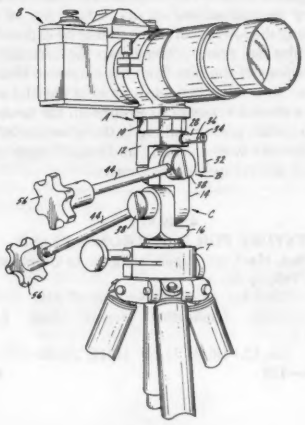
Robert E. Blau, 791 Rosewood Ave., Winnetka, Ill. 60093

Filed May 21, 1979, Ser. No. 41,018

Int. Cl.[3] **G03B** *17/00;* **F16M** *11/12*

U.S. Cl. 354—293 **5 Claims**

1. A camera mount for adjustably positioning a camera relative to a main camera support comprising: a plurality of means providing for adjustable positioning of the camera about three perpendicular axes and means for releasably clamping the plurality of adjustment means to maintain the position of the camera relative to each axes of the axes when independently located relative thereto, wherein at least one of said adjustment means includes a block defining a bore, a shaft, the shaft having a channel which divides the shaft into at least two sections along less than the entire length of the shaft which is received by said bore, means for adjusting the effective circumference of said shaft between a first dimension wherein said shaft is prevented from rotational movement within said bore and a second dimension wherein the shaft is free to rotate within said bore at the channeled end of the shaft and means



for removably attaching the camera mount to a camera and its main support.

4,249,818

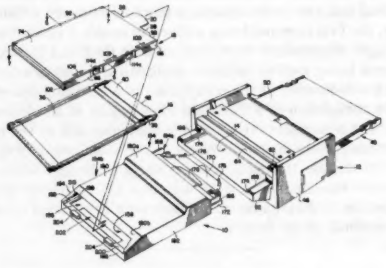
CASSETTE RECEIVING APPARATUS FOR USE WITH LARGE FORMAT FILM PROCESSOR

Daniel A. Buldini, Melrose, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 31, 1979, Ser. No. 108,453

Int. Cl.[3] **G03D** *9/02;* **G03B** *41/18*

U.S. Cl. 354—312 **11 Claims**



1. Photographic apparatus for use with a film processor for receiving a cassette holding an exposed film unit and including releasably latched means for applying pressure to the film unit to urge it against a surface within the cassette, for supporting the cassette at an operative position wherein a film withdrawal slot at a leading end of the cassette is adjacent an entry of the processor, and for unlatching the pressure applying means to substantially reduce the pressure on the film unit and thereby facilitate its movement over the surface as the film unit is advanced through the withdrawal slot into the processor entry, the cassette also being of the type including longitudinally spaced forward and rear pressure latch release members that are forwardly biased into a pressure latching position and upon actuation are adapted to be moved rearwardly therefrom to an unlatching position, the forward and rear release members each having a different configuration, said apparatus comprising:

a body;

means for attaching said body to the processor;

a longitudinally extending cassette receptacle formed on said body for receiving such a cassette advanced thereinto, leading end first, toward the processor entry and for supporting the cassette at said operative position; and

forward and rear latch release actuating means for, respectively, engaging and actuating the forward and rear latch release members on the cassette, said forward and rear actuating means being longitudinally spaced along a path of travel followed by the forward and rear release members as the cassette is advanced into said receptacle so that the forward release member passes by said rear actuating means before it is in position to be engaged by said forward actuating means, said forward actuating means having a first configuration that is complementary to the configuration of the forward release member so as to become coupled thereto upon engagement and said rear actuating means having a second configuration that is complementary to the different configuration of the rear release member so as to become coupled thereto upon engagement but yet allowing engagement with the forward release as it passes by without becoming coupled thereto, said forward and rear actuating means being arranged so as to become coupled to the forward and rear release members, respectively, as the cassette approaches said operative position and thereafter effecting rearward movement of the forward and rear release members to the unlatching positions in response to further movement of the cassette toward said operative position.

4,249,819

ARRANGEMENT FOR FEEDING SHEETS INTO A DEVELOPING MACHINE

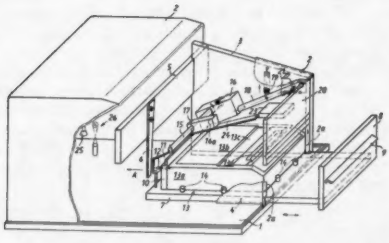
Heinz Boser, and Nikolaus Jelinek, both of Munich, Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Oct. 11, 1979, Ser. No. 83,631

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1978, 2845077

Int. Cl.[3] G03B *41/18;* G01N *23/04*

U.S. Cl. 354—312 **15 Claims**



1. An arrangement for presenting sheets of light-sensitive material which are accommodated in light-tight containers having lids movable between closed and open positions, to a sheet-treating device having an inlet opening, comprising a closure mounted on the device for displacement between an extended position in which it light-tightly closes the inlet opening and a retracted position in which it is removed from the latter; means for displacing said closure from said retracted into said extended position in response to movement of a respective container completely through the inlet opening into the device in one direction and in an initial path section; and means for moving the lid of the container into the open position in response to further movement of the container in said one direction in a terminal path section.

4,249,820

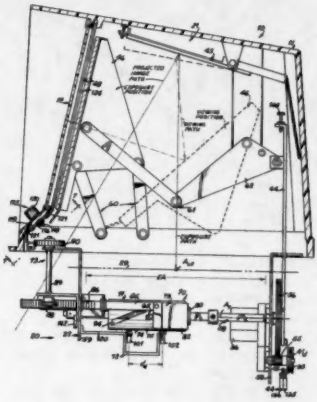
REGISTRATION CONTROL SYSTEM FOR COPY MACHINE

Lawrence M. Freeman, 3160 Buford Hwy., Apt. A-18, Atlanta, Ga. 30329, and Francis T. Arnold, 2379 Tristan Cir., NE., Atlanta, Ga. 30345

Filed Mar. 26, 1979, Ser. No. 24,017

Int. Cl.[3] G03B *27/52*

U.S. Cl. 355—29 **10 Claims**



1. A registration control system for a copy machine adapted to copy images from an original document medium onto selected different length sheets of copy paper with the copy machine having a conveying means for transporting the sheets of copy paper along a conveying path through an exposure station with the image projected onto the sheet of copy paper in the exposure station with a transverse central axis normal to the conveying path, said registration control system comprising:

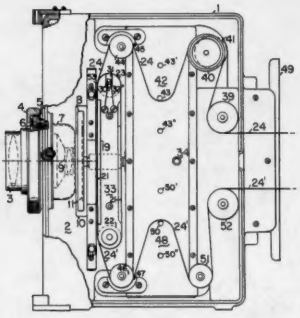
conveyor actuator means for causing the conveying means to move the sheets of copy paper through the exposure station; and

adjustable control means for causing said conveyor actuator means to operate said conveying means so that each sheet of copy paper is moved through exposure station so that its transverse central axis normal to the conveying path is in registration with the transverse image central axis of the projected image during exposure of the sheet of copy paper, said adjustable control means including camming means synchronously driven with the movement of the sheets of copy paper through the exposure station, said camming means operatively associated with said conveyor actuator means to operate said conveyor actuator means when said camming means reaches a prescribed position; and adjustment means for effectively varying said prescribed position at which said conveyor actuator means is operated to compensate for changes in length of the sheets of copy paper so that the transverse central axis of each sheet of copy paper normal to the conveying path remains in registration with the transverse image central axis of the projected image during the exposure of the sheet of copy paper as the length of the sheets of copy paper is changed.

4,249,821
BELT MICROFILM CAMERA

Michael W. Rudy, Thousand Oaks; Forrest L. Langford, Northridge, and Robert D. Therien, Newbury Park, all of Calif., assignors to Terminal Data Corporation, Woodland Hills, Calif.

Filed Jun. 21, 1979, Ser. No. 50,731
Int. Cl.³ G03B *27/32, 27/60*
U.S. Cl. 355—64 **18 Claims**



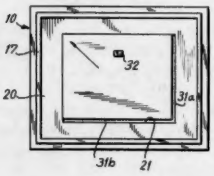
1. A microfilm camera, comprising;
(a) a stationary image-forming lens **(3)**,
(b) a constant-vacuum platen **(19)** disposed slightly behind the image-forming plane of said lens,
(c) more than two closely adjacent coplanar flexible belts **(21)** traversing said vacuum platen at substantially said image-forming plane,
(d) a drive pulley **(22)** to drive said belts by friction,
(e) unexposed film supply means **(35,40)**, having a first vacuum film-loop chamber **(42)** adjacent to said belts, with a first sensor **(43)** sensitive to the position of the first film loop,
(f) exposed film take-up means **(53,56)** having a second vacuum film loop chamber **(48)** adjacent to said belts, with a second sensor **(50)** sensitive to the position of the second film loop,
(g) means to direct said film to **(44)** and from **(46)** said belts for vacuum-adhesion drive of said film by said belts,
(h) drive means **(26,27,28)** connected to said drive pulley,
(i) logic means **(69)** to control the operation of the recited elements of said microfilm camera, connected to receive inputs from said first and second sensors, and connected to said unexposed film supply means, said exposed film take-up means, and said drive means,
to expose film while that film and said belts are stationary, and to translate that film vacuum-adhered to said belts between exposures.

4,249,822
METHOD AND APPARATUS FOR PRINTING BLACK BORDERS ON PHOTO PRINTS

Steven M. Breslau, Cranford, N.J., assignor to Pace Photographic Products, Inc., Chicago, Ill.

Filed May 10, 1979, Ser. No. 37,838
Int. Cl.³ G03B *27/58*
U.S. Cl. 355—74 **11 Claims**

5. Apparatus for imparting a uniform border bounding an image, said apparatus comprising an outer mask of closed outline configuration having a central opening for location in covering relation with the margin of a light sensitive printing sheet to expose the initially uncovered region thereof, and an opaque inner mask generally conforming in shape to said central opening and having smaller dimensions in relation thereto to permit selective movement of said second mask between a plurality of positions in the plane of said first mask and within said central opening to leave uniform width portions of a finally uncovered printing sheet region in each of said plurality of positions, whereby movement of said second mask to each

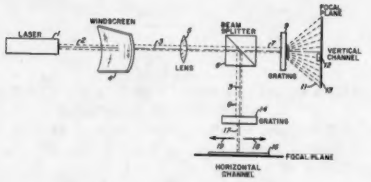


of said plurality of positions results in said uniform finally uncovered printing sheet region which totally bounds said initially uncovered printing sheet region.

4,249,823
WINDSCREEN ANGULAR DEVIATION MEASUREMENT DEVICE

Harry L. Task, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 16, 1979, Ser. No. 85,453
Int. Cl.³ G01N *21/41*
U.S. Cl. 356—128 **7 Claims**



1. An apparatus for measuring the angular deflection caused by a transparent medium, comprising:
a. means for illuminating a test region of space with a laser beam projecting along an optical axis passing through said region;
b. a transmission diffraction grating having fine, parallel lines of substantially random size and spacing, lying in a plane which is intersected by said optical axis;
c. a linear array of detectors responsive to laser luminous energy passing through said grating, lying in a plane substantially perpendicular to the optical axis and oriented to have its longitudinal axis parallel to the grating lines; and
d. a displacement compensation lens, on the optical axis, at an optical distance corresponding to its focal length from the detector system.

4,249,824
APPARATUS FOR MEASURING WHEEL ALIGNMENT OF MOTOR VEHICLES

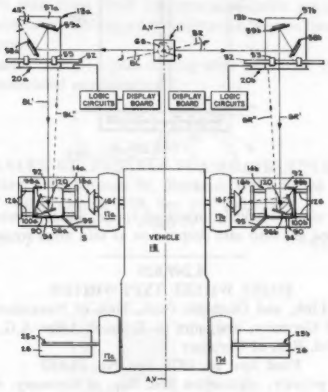
James L. Wiederrich, Lodi; Andrew K. Chang, Malibu, and Julius J. Muray, Los Altos, all of Calif., assignors to FMC Corporation, San Jose, Calif.

Filed Jun. 8, 1978, Ser. No. 913,779
Int. Cl.³ G01B *11/275;* G02B *11/17*
U.S. Cl. 356—155 **13 Claims**

1. Apparatus for measuring wheel alignment of a motor vehicle comprising:
light source means for projecting at least one primary beam of light originating from said light source means in a direction determined by the orientation of the source;
means for adjusting said source means to change the direction of said primary beam in the horizontal plane;
primary mirror means for receiving said primary beam and

reflecting two beams therefrom in a parallel manner, said primary mirror means comprising a plurality of reflecting surfaces for reflecting both reflected beams generally parallel to the axis of the vehicle, said reflecting surfaces being angularly disposed for maintaining the angle between the incident primary beam and the reflected beams constant through a range of changes in the direction of the incident primary beam whereby adjusting the direction of said primary beam effects any adjustment required to align the reflected beams with the vehicle axis;

mirror means mounted on the wheel to be aligned for receiving said reflected beam from said primary mirror means;



a target positioned at a predetermined distance from said wheel mirror means for receiving the beam reflected therefrom for indicating the alignment of said wheel; and

relay mirror means for receiving said reflected beams from said primary mirror means and for reflecting them to said wheel mirror means and for receiving the reflected beams from said wheel mirror means and for reflecting them to said target, said relay mirror means adapted to maintain a constant angle between any incident beam and the associated reflected beam through a range of changes in the direction of the incident beam.

4,249,825

METHOD AND APPARATUS SUITABLE FOR OCULAR BLOOD FLOW ANALYSIS

Jerrold M. Shapiro, Natick, Mass., assignor to The Trustees of Boston University, Boston, Mass.

Filed May 14, 1979, Ser. No. 38,610
Int. Cl.³ G01J 1/42
U.S. Cl. 356—223 **17 Claims**

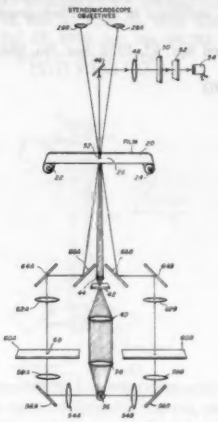
1. A film analysis system for determining the optical density of an image on successive film frames at the same preselected image sites, the image position on the frames being subject to change from frame to frame, the system comprising:

a film carrier;

a sensing optical system for illuminating a film on the carrier and for projecting the light from an illuminated point onto a photodetector;

drive means for providing relative movement between the sensing optical system and the film carrier to illuminate selected points on the film; and

drive control means, including a control data memory, for controlling automatic relative movement of the sensing optical system and the film carrier from an initial film position to subsequent positions in accordance with stored



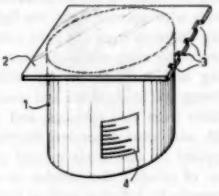
position control data to successively illuminate preselected image sites.

4,249,826

METHOD AND DEVICE FOR ANALYZING AND MEASURING OUT CONSTITUENTS OF SOLID OR LIQUID MEDIA

Claude Studievic, Paris; Guy Brossard, Osny, and Philippe Yribarren, Saint Jean De Luz, all of France, assignors to Laboratoires Biotrol S.A., Paris, France

Filed Jul. 19, 1978, Ser. No. 925,981
Claims priority, application France, Jul. 25, 1977, 77 22796
Int. Cl.³ G01N 21/01
U.S. Cl. 356—244 **25 Claims**



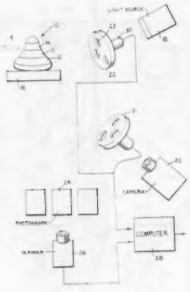
1. Device, useful for the analysis and measurement of constituents of solid or liquid media, comprising a hermetically closed container, said container constituting a single chamber adapted to contain chemical or biological reactants necessary for the analysis, in liquid, lyophilized or solid form, said chamber providing a hollow space formed in material perforatable on all surfaces thereof, said material being inert with respect to the participants in the reaction, and adapted to receive through said perforatable material means respectively (1) for the introduction of diluents and/or test samples of the medium to be measured and (2) for the measurement of the reaction enabling the measurements in situ, and said container further including an irremovable cover on said chamber, rigid and optically flat on at least its inner surface and optically transparent over at least its central portion.

4,249,827

ARRANGEMENT FOR COLOR CODING OF SURFACES

Paul DiMatteo, Huntington, and Howard K. Stern, Greenlawn, both of N.Y., assignors to Solid Photography Inc., Melville, N.Y.

Filed Apr. 17, 1978, Ser. No. 896,891
Int. Cl.³ G01N *21/25*
U.S. Cl. 356—402 **10 Claims**



1. A method for color coding surfaces of an object comprising the steps of: applying at least one color to a surface of the object; illuminating said surface with electromagnetic radiation; modifying said electromagnetic radiation in accordance with a predetermined color dependent function; observing at least one characteristic in electromagnetic radiation reflected from said surface; combining a predetermined number of colors in a digital combination of presence and absence to identify uniquely each of a plurality of surfaces; said color applying step including applying said color with layers of transparent paint having a colorless vehicle with colored particles suspended therein, said particles having an index of refraction differing from the index of refraction of the vehicle, said particles forming filters in paths of light rays in the paint, incident light reflected back out of the paint passing through said filters when entering and exiting and each filter absorbing some light incident upon it, the spectral distribution of incident light being modified by the absorption of coloring the paint; said illuminating step comprising illuminating the surfaces during a plurality of separate intervals with colored light; the light color during each interval being different from the light colors illuminating said surfaces during other intervals; said observing step including photographing said surfaces during each said interval; scanning each photograph in sequence and sensing said characteristic in reflections from said surfaces; and correlating said characteristic with said color dependent function for identifying the color applied to said surface; said correlating step including the step of relating the number of surfaces to the number of photographs by a digital code so that the number of photographs taken is substantially less than the number of surfaces to be identified.

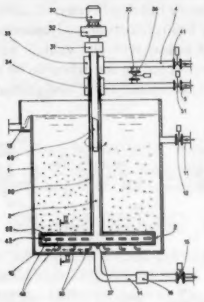
4,249,828

APPARATUS FOR MAINTAINING SOLIDS IN A SUSPENSION AND A METHOD OF USING IT

Elie Condolios, Grenoble, France, assignor to Alsthom-Atlantique, Paris, France

Filed Sep. 7, 1978, Ser. No. 940,232
Claims priority, application France, Sep. 13, 1977, 77 27596
Int. Cl.³ B01F *3/04, 3/08, 7/20*
U.S. Cl. 366—102 **11 Claims**

1. Apparatus for maintaining solids in suspension in a vat, said apparatus including a stirrer having rotating arms positioned within said vat, a source of liquid under pressure, a source of compressed gas, the improvement wherein said rotating arms comprise concentric, spaced inner and outer tubes, means for connecting said source of liquid to said space between said inner and outer tubes and said compressed gas source to said inner tube, and said inner and outer tubes containing aligned holes at longitudinally spaced positions along the complete length thereof and about the periphery of said



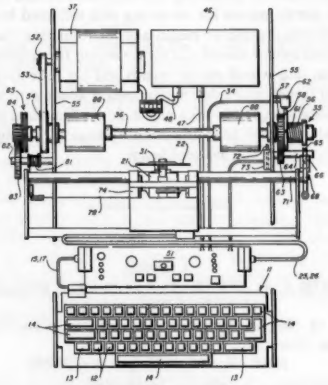
tubes for simultaneously injecting liquid under pressure and compressed gas into said suspension as said arms rotate.

4,249,829

DAISY WHEEL TYPEWRITER

Manfred Link, and Diethelm Puch, both of Nuremberg, Fed. Rep. of Germany, assignors to Triumph-Adler A.G., Nurnberg, Fed. Rep. of Germany

Filed Apr. 16, 1979, Ser. No. 30,632
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1978, 2819140
Int. Cl.³ B41J *1/30*
U.S. Cl. 400—144.2 **3 Claims**



1. A typewriter having a daisy wheel printing element positionable to present a selected type character on said wheel for printing,

a keyboard for generating type character selection signals,

a daisy wheel positioning motor,

positioning electronics connected to the output of said keyboard and responsive when enabled by a positioning initiating control signal to energize said positioning motor thereby to present for printing selected type characters corresponding to keyboard generated type character selection signals applied thereto,

hammer electronic means operable when enabled by a hammer control signal for driving a selected type character presented for printing to print,

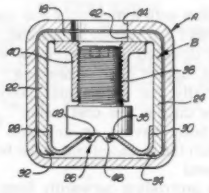
a first continuously rotatable shaft,
a second control shaft,
signal transmitter means on said second control shaft for generating timing signals,
electronic control means responsive to keyboard generated type selection signals and to said timing signals for issuing cycle initiating, positioning initiating and hammer control signals,
cycle clutch means responsive to a cycle initiating control signal for coupling said first shaft to said control shaft,
a third shaft,
means responsive to rotation of said second shaft for oscillating said third shaft, and
means on said third shaft for operating print associated mechanisms controlling ribbon elevation, ribbon feed, and escapement,
said hammer control signal issuing after operation of said print associated mechanisms.

4,249,830

CONCEALED RELEASABLE FRAME STRUCTURE

Robert L. Day, 1518 Grismer St., Burbank, Calif. 91504

Filed Aug. 3, 1978, Ser. No. 930,578
Int. Cl.³ F16B *7/18*
U.S. Cl. 403—7 **4 Claims**



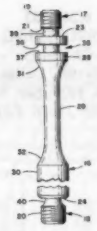
1. In combination:
(a) a first tubular frame element of rectangular cross-sectional configuration having a lateral access opening in one side wall adjacent one end of the frame element, said access opening being completely surrounded by the material of said frame element;
(b) a connector adapted to be mounted at one end to a companion second frame element or the like;
(c) said connector having a body sized for telescopic insertion into the said one end of said first frame element, said body having a central web paralleling said one side wall of said frame element and having side flanges closely paralleling other opposite side walls of said first frame element, said side flanges being capable of outward resilient flexure toward said other opposite side walls, respectively;
(d) a toggle spring extending across said connector body with arms positioned to engage the flanges, said toggle spring being angled or bowed inwardly toward said web part, said spring having a central pivot or fulcrum part;
(e) a thrust member in the form of a jack screw movably mounted by said web part an axially interlocked with said pivot or fulcrum part, and movable to flatten and thereby to extend said toggle spring and to flex said flanges into frictional abutting engagement with the said opposite side walls of said first frame;
(f) means limiting said jack screw to a range of movement within said web part so that it never projects beyond said web part thereby never to interfere with telescopic movement of said connector relative to said first frame element; and
(g) said web part having an access opening to the end of said jack screw that registers with the access opening of said first frame element.

4,249,831

WELL TOOL

Donald E. Sable, 4413 Windsor Pkwy., Dallas, Tex. 75205, and Donald E. Sable, II, Box 1778, Mills, Wyo. 82644

Filed Jul. 25, 1979, Ser. No. 60,294
Int. Cl.³ F16B *7/18*
U.S. Cl. 403—12 **1 Claim**



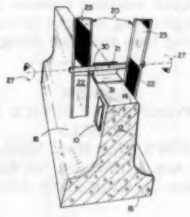
1. A sinker bar connectible to a hoist connector comprising: an elongate body; a reduced threaded top pin; and a reduced threaded bottom pin, said pins extending longitudinally in opposite directions from opposite ends of said body, said body having a top portion, a bottom portion and a reduced portion between said top and bottom portions, said top portion having an external annual groove providing means for connecting said body to a hoist connector, said top portion being of substantially shorter length than said bottom portion, said means comprising an annular downwardly facing stop surface defining the top of said groove engageable by an upwardly facing surface of a hoist connector, said sinker bar being circular in cross section throughout its length.

4,249,832

HIGHWAY MEDIAN DELINEATOR

Donald W. Schmanski, Carson City, Nev., assignor to High Performance Composites, Inc., Carson City, Nev.

Filed Dec. 13, 1978, Ser. No. 969,083
Int. Cl.³ E01F *15/00*
U.S. Cl. 404—6 **9 Claims**



1. A median barrier delineator comprising:
a. a pair of elongate webs, each having a geometric structure which deforms upon impact by a moving object to develop a nondestructive bending response, with subsequent restoration to its approximate original orientation and configuration;
b. an elongate mounting arm attached at each end thereof to one of the elongate webs such that the mounting arm supports the elongate web pair in an upright orientation, and has sufficient length such that the attached webs are displaced a sufficient distance away from the median barrier to permit the web to freely contort about the mounting arm upon occurrence of said impact by the moving object, said arm being comprised of materials having sufficient rigidity to support said web pair during

static conditions, but sufficient contortional compliance and flexibility to bend and twist during dynamic conditions resulting from the impact; and

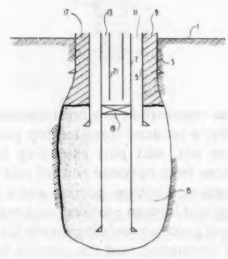
c. attachment means disposed centrally along the mounting arm for coupling the arm with mounted webs across said median barrier in an upright orientation with respect to sidewalls of the median barrier.

4,249,833

METHOD OF DEPRESSURIZING A LEACHED SALT CAVERN

Billy D. Talley, 6110 Shadycliff, Dallas, Tex. 75240

Filed Jul. 24, 1979, Ser. No. 60,403
Int. Cl.[3] E21F *17/16;* E21B *43/28*
U.S. Cl. 405—58 **1 Claim**



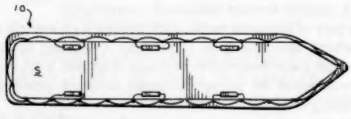
1. A method of depressurizing a salt cavern in which surface casing has been inserted to about a depth corresponding to the height of the roof of the cavern to be formed and inner and outer leach strings have been inserted in the surface casing and cavern to define between the surface casing and the outer leach string a first annulus and between the two leach strings a second annulus and in which an inert liquid has been injected in said first annulus to protect the cavern roof against leaching and to form an interface with aqueous leaching liquid in the cavern, which method comprises shutting in said first and second annuli with pressure, inserting inert liquid into said second annulus to displace said aqueous liquid down to about the level of said interface, inserting a packing plug in said inner string at about said level, replacing aqueous liquid above said plug with inert liquid, releasing pressure from beneath said packing plug through tubing to above the surface, and retrieving said packing plug from said inner string.

4,249,834

OIL SPILL CONTAINMENT DEVICE FOR AQUATIC VESSELS

Julien J. Bouvier, 5600 S. Crain Hwy., Mitchellville, Md. 20716

Filed Aug. 8, 1978, Ser. No. 932,009
Int. Cl.[3] E02B *15/04, 3/04*
U.S. Cl. 405—70 **24 Claims**



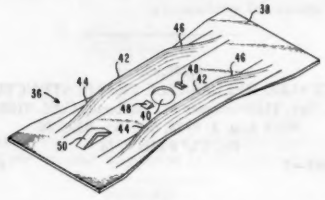
1. An oil containment device comprising a plurality of collar elements interconnected to surround a vessel, a plurality of flexible, weighted skirt members fastened to said collars depending therefrom and also interconnected to surround said vessel, said skirt elements are interconnected by mechanical hook and eyelet fasteners in which said mechanical hook fasteners are disposed on a vertical edge of one skirt and the eyelets are disposed on a vertical edge of another skirt adapted to register therewith, and wherein said skirts are further interconnected by means of magnetic attraction in which pockets are disposed in each vertical edge of the registering skirts colinear with said hook and eyelet and wherein one pocket contains metal filings and said other pocket contains a permanent magnet and tether means connecting said vessel to said collar elements so as to control the distance between said vessel and said collar elements which surround the periphery of said vessel.

4,249,835

MINE ROOF SUPPORT PLATE

Claude C. White, P.O. Box 1208, Birmingham, Ala. 35201

Filed Feb. 8, 1979, Ser. No. 10,429
Int. Cl.[3] E21D *21/00;* F16B *29/00*
U.S. Cl. 405—259 **3 Claims**



1. In combination with a mine roof bolt assembly including a bolt having a head and washer at one end, the opposite end of the bolt being threaded for engagement with an expansion shell, a mine roof support plate comprising

(a) a substantially flat rectangular body made of high strength, low ductile, low cost metal

(b) said flat body having an enlarged central opening through which the threaded end of the bolt and expansion shell are passed

(c) spaced ribs protruding outwardly from one face of said flat body on both sides of the enlarged central opening, and extending longitudinally through the major portion of the body's length, for adding strength to the flat body

(d) the distance between said ribs being substantially equal to the diameter of the washer of the roof bolt assembly, whereby the bolt periphery proximate the ribs will be spaced equidistant from the portion of the flat body defining the central opening thereof, and

(e) upstanding, spaced protrusions on said one face of said flat body on both sides of said enlarged central opening and intermediate the spaced ribs

(f) the distance between said spaced protrusions being substantially equal to the diameter of the washer of the roof bolt assembly, whereby the bolt periphery proximate the protrusions will be spaced equidistant from the portion of the flat body defining the central opening thereof.

4,249,836

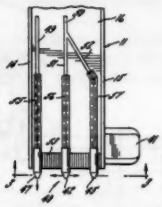
METHOD AND APPARATUS FOR BUILDING BELOW GROUND SLURRY WALLS

Fred C. Schmednecht, Mount Prospect, Ill., assignor to Slurry Systems, Inc., Gary, Ind.

Filed Aug. 2, 1976, Ser. No. 710,640
Int. Cl.[3] E02D *5/18, 29/00*
U.S. Cl. 405—267 **15 Claims**

1. Apparatus for building below ground slurry walls comprising, in combination, a beam for making successive overlapping insertions into and extractions out of the ground along a line of travel, means for substantially vertically aligning said beam and for vibrating said beam during successive insertions and extractions, said beam having a substantially I-beam cross section with front and rear transverse flanges and a central web disposed substantially along said line of travel, said beam having a rigid fin adjacent the lower end thereof projecting rear-

wardly therefrom along said line of travel a substantial distance into the previous insertion to prevent necking down of the previously formed wall portion, and supply nozzle means adjacent the lower end of said beam including one nozzle located adjacent said fin and having a substantially rearwardly



directed orifice and a second nozzle located forwardly thereof on the beam end and having at least one discharge orifice disposed substantially parallel to the beam web for injecting slurry material into the void in the ground beneath the beam and fin as the beam is extracted.

4,249,837

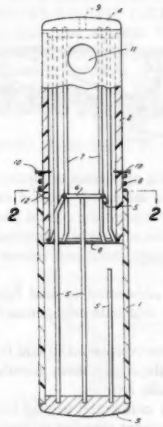
METHOD OF AND APPARATUS FOR SUPPORTING AN OVERBURDEN

Klaus Spies, Dortmund, Fed. Rep. of Germany, assignor to Heintzman GmbH & Co., Bochum, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 850,096, Nov. 8, 1977. This application Nov. 3, 1978, Ser. No. 957,355

Int. Cl.³ E21D *15/18, 15/22*

U.S. Cl. 405—290 **56 Claims**



1. A method of supporting a roof, particularly a roof of an underground excavation such as a mine, comprising the steps of providing a hollow prop casing composed of at least two non-loadbearing telescopable sections, erecting the prop casing and telescoping it apart until it bears upon the floor and upon the roof to be supported; biasing the sections of the prop casing in the telescoped-apart position against the floor and the roof, respectively, so that the prop casing is thereby held in place, but without having any loadbearing function; and only thereafter filling the prop casing with a hardenable substance in flowable condition so that the prop casing acts as a form for the hardenable substance until the latter, upon hardening thereof, forms a solid column which by itself is able to support said roof.

4,249,838

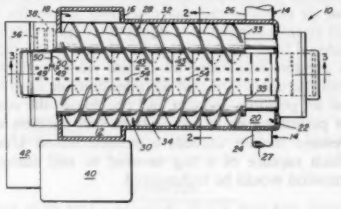
SEALED FLIGHT SCREW INJECTOR

Andrew C. Harvey, Waltham, and Mackenzie Burnett, Wayland, both of Mass., assignors to Foster-Miller Associates, Inc., Waltham, Mass.

Filed Aug. 23, 1979, Ser. No. 68,962

Int. Cl.³ B65G *53/40*

U.S. Cl. 406—51 **12 Claims**



12. A material transport device comprising:

(a) a housing with an inlet station at one end and an outlet station at an opposite end;

(b) screw means with helical blades means mounted within said housing for rotation;

(c) a plurality of plate means slidably mounted within said housing, one of each said plate means fitted between successive turns of said blade means, a pocket for carrying material to be transported from said inlet station to said outlet station formed by each of said plate means and said blade means and said housing; and

(d) driver means drivingly connected to said screw means for rotating said screw means for moving said plate means from said inlet station to said outlet station.

4,249,839

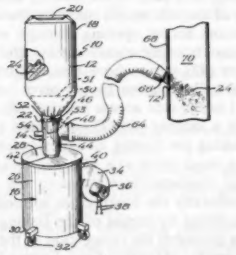
METHOD AND APPARATUS FOR SUSPENDING AND TRANSPORTING PARTICULATE MATERIAL

Joseph E. Vance, 1113 Como Pl., St. Paul, Minn. 55103

Filed Sep. 13, 1978, Ser. No. 942,067

Int. Cl.³ B65G *53/28*

U.S. Cl. 406—109 **9 Claims**



1. As a new article of manufacture: An adapter for attachment to an upwardly directed air outlet of a portable air generating source to thereby form a base assembly for suspending and transporting particulate thermal insulation from a closed flexible shipment and storage bag directly through a delivery conduit into a building space, said adapter consisting of:

(a) a conduit junction consisting of a downwardly directed air inlet conduit for communicative attachment to an upwardly directed air outlet of a portable air generating source, a particulate inlet conduit positioned in substantial alignment with said air inlet conduit and extending upwardly substantially diametrically opposite said air inlet

conduit, and an outlet conduit extending between and at substantially a right angle to said air inlet and particulate inlet conduits,

(b) an upwardly directed funnel-shaped extension united communicatively with said particulate inlet conduit,

(c) a releasable retaining means for communicatively securing a closed flexible shipment and storage bag of particulate thermal insulation to said funnel-shaped extension in a manner permitting gravity drop of particulate thermal insulation from the bag into said funnel-shaped extension,

(d) an air pervious member extending across the inside of said air inlet conduit of said junction to prevent particulate material from passing through said air inlet conduit, and

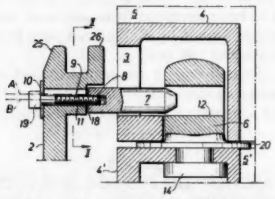
(e) a pressure responsive air release means communicating with the interior of said air inlet conduit upstream from said air pervious member and opening to the atmosphere for permitting air to escape from said junction when the pressure therein exceeds a predetermined level above which rupture of a bag secured to said funnel-shaped extension would be endangered.

4,249,840

LASHING ROD

Elis Kallaes, and Karl-Erik Starell, both of Orsa, Sweden, assignors to Orsa Kattingfabrik AB, Orsa, Sweden

Filed Jan. 17, 1979, Ser. No. 4,156
Claims priority, application Sweden, Jan. 20, 1978, 7800735
Int. Cl.³ F64B *17/00;* B61D *17/00;* A65B *35/00*
U.S. Cl. 410—81 **8 Claims**



1. In a lashing rod (2) having a locking head (1) for connection to a corner casting (4) of a container (5) through a side access opening (3) in such corner casting (4), the locking head (1) being pivotable in the side access opening about a pivot axis whereby a locking stud (26) on the locking head (1) engages behind the edge of the side access opening, the corner casting (4) having a bottom access opening through which a fitting extends into the cavity of the corner casting, the fitting having a horizontal bore (12) with a bore axis, the bore axis being arranged eccentrically relative to the pivot axis (A) of the locking head (1) in the side access opening (3), the improvement comprising a locking pin (7) connected to the locking head (1), the locking pin having an axis substantially parallel with the locking head pivot axis (A), the locking pin being arranged parallel displaceable relative to the locking head pivot axis (A), whereby the locking pin is insertable into the bore (12) of the fitting by means of the lashing rod, and the lashing rod (2) is pivotable for connection of the locking head (1) to the corner casting (4) without interference by the locking pin (7).

4,249,841

WIRE PICKING FROM A WIRE BUNDLE

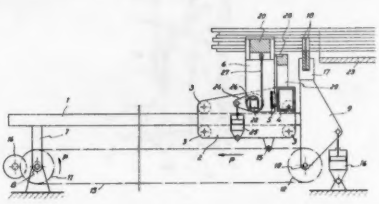
Hans Gött; Josef Ritter; Klaus Ritter; Gerhard Ritter, and Gerhard Schmidt, all of Graz, Austria, assignors to EvG Entwicklungs-u. verwertungs-GmbH, Graz, Austria

Filed Dec. 7, 1978, Ser. No. 967,406
Claims priority, application Austria, Dec. 13, 1977, 8902/77
Int. Cl.³ B21F *23/00;* B65G *59/06*
U.S. Cl. 414—14 **13 Claims**

1. In a method of selecting and transporting wires from a loose bundle of cut wires with the aid of a supporting surface for the cut wires, and free from any rotation means, the steps comprising:

(a) placing said loose bundle of wires on said supporting surface, so that end parts of said wires project freely therebeyond,

(b) raising the end parts of a majority of said wires with respect to the remaining end parts thereof,



(c) simultaneously with the raising step arranging the remaining end parts of said wires one above the other in a substantially vertical plane,

(d) gripping the end part of the lowermost wire in said substantially vertical plane, and

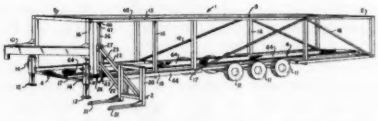
(e) withdrawing the gripped wire from said loose bundle of wires substantially along its longitudinal direction.

4,249,842

SELF LOADING MULTIPLE BALE TRAILER

Howard L. Johnson, 4500 NW. 108th St., Kansas City, Mo. 64154

Filed Sep. 28, 1978, Ser. No. 947,168
Int. Cl.³ B60P *1/38, 1/46;* A01D *87/12*
U.S. Cl. 414—24.5 **20 Claims**



11. A bale handling apparatus comprising in combination:

(a) a trailer frame including ground engaging wheels and hitch means for connection of said frame to a tow vehicle;

(b) a bale engagement member mounted on said frame and operable to engage, hold and release a large cylindrical bale;

(c) lifting means connected to said frame and operable to raise and lower said bale engagement member relative to said frame;

(d) revolving means connected to said frame and operable to revolve said bale engagement member about a substantially vertical axis; and

(e) a stop member connected to said frame and engaged by said bale engagement member to prevent rotation thereof during engagement of a bale thereby.

4,249,843

APPARATUS FOR LOADING, UNLOADING AND STACKING HAY BALES

Robert J. Kerr, Rte. 4, Stephenville, Tex. 76401

Filed Sep. 14, 1978, Ser. No. 942,289
Int. Cl.³ B60P *1/34*
U.S. Cl. 414—44 **8 Claims**

1. Apparatus for loading, unloading and stacking hay bales, comprising:

a. a load carrying vehicle;

b. a load carrying bed or platform;

c. bed elevating means mounted on said vehicle and opera-

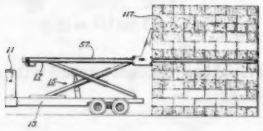
tively connected to said bed, with said elevating means being capable of tilting said bed about an axis extending transversely of said bed;

d. headboard or pusher means mounted on said bed and extending transversely of said bed;

e. carriage means for said headboard permitting traverse of said headboard longitudinally from the front to the rear of said bed;

f. power means for driving said headboard carriage;

g. a tine structure having width about the same as that of said bed and length greater than that of said bed;



h. means mounting said tine structure on said bed and permitting traverse of said tine structure longitudinally of said bed from a retracted position wherein a load carrying portion of said tine structure is about co-extensive with said bed to an extended position wherein said load carrying portion of said tine structure protrudes from the end of said bed sufficiently to extend beneath and support an entire vehicle load;

i. power means for driving said tine structure.

4,249,844

APPARATUS FOR ACCUMULATING STACKS OF NOTE BOOKS OR THE LIKE

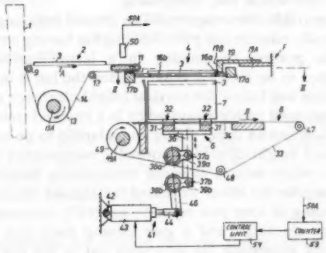
Siegfried Lampe, Ellerbek, and Siegmar Neubüser, Hamburg, both of Fed. Rep. of Germany, assignors to E. C. H. Will (GmbH & Co.), Hamburg, Fed. Rep. of Germany

Filed Feb. 21, 1979, Ser. No. 13,625

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1978, 2808948

Int. Cl.³ B65G *57/06*; B65H *29/34, 31/30*

U.S. Cl. 414—45 **7 Claims**



1. Apparatus for accumulating sheets into stacks, particularly for accumulating piles of sheets into larger stacks, comprising a plurality of receptacles each having a bottom wall including substantially parallel elongated first and second portions, said first portion of each bottom wall being movable toward and away from the respective second portion and said second portion of each bottom wall being movable toward and away from the respective first portion between a first position in which said bottom walls can support piles of sheets and a second position in which the piles of sheets are free to leave the respective receptacles by gravity; means for feeding piles of sheets to said receptacles in the first positions of said portions including conveyor means operative to transport piles of sheets to said receptacles in a predetermined direction which is substantially parallel to the longitudinal directions of said portions of said bottom walls; means for transporting said portions of said bottom walls between said positions, including first support means for said first portions, second support means for said second portions and means for simultaneously moving said first and second support means so as to move said portions of said bottom walls toward each other during movement of said portions to said first positions and apart during movement of said portions to said second positions; means for intercepting the descending piles of sheets at a level below said receptacles so that the intercepted piles accumulate on top of each other to form discrete stacks, one below each receptacle; and means for separably coupling said portions of said bottom walls to the respective support means so as to permit for adjustment of said portions of said bottom walls transversely of said direction.

4,249,845

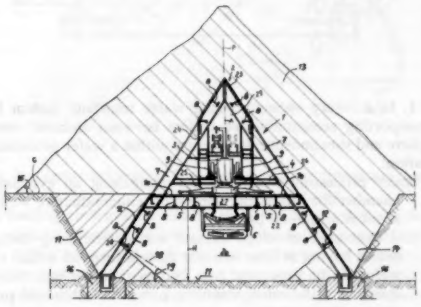
SYSTEM FOR RECLAIMING BULK SOLIDS FROM A STORAGE PILE

Lothar Teske, Hegelstrasse 15, 5000 Köln, Fed. Rep. of Germany

Filed Nov. 30, 1978, Ser. No. 964,922

Int. Cl.³ B65G *63/00*

U.S. Cl. 414—133 **7 Claims**



1. A system for reclaiming bulk solids from a large bulk-solids storage pile standing on the ground, said system comprising:

a row of A-frame arches extending underneath said pile and each having a pair of legs having feet standing on the ground and a horizontal cross member spanning the respective legs;

a guide supported on said arches and extending longitudinally along said row of arches;

an elongated downwardly concave roof supported on said row of arches and having horizontally spaced lower edges spaced above the ground;

a pair of longitudinally extending generally parallel tables supported on said cross members of said arches below said lower edges of said roof and below said guide and each having an outer edge turned away from the other table and an inner edge defining with the inner edge of the other table a horizontally extending slot, whereby said bulk solids can flow under said lower edges onto said tables;

a carriage displaceable longitudinally along said guides above said slot and under said roof;

an impeller on said carriage displaceable across said tables and along said slot and having arms extending horizontally outwardly beyond said roof below said lower edges thereof;

means for driving said impeller and sweeping material on said tables into said slot with said arms;

a longitudinally extending conveyor hung from said cross

members underneath and generally parallel to said slot above said feet;

means for operating said conveyor and thereby longitudinally carrying away bulk solids swept by said arms of said impeller into said slot and falling onto said conveyor; and

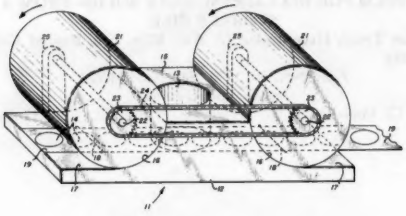
respective sidewalls flanking said conveyor and supported on said arches, said sidewalls each having an upper edge joined to the respective table and a lower edge spaced above the ground.

4,249,846

ROTARY VACUUM SEAL FOR A WAFER TRANSPORT SYSTEM

Daniel Worsham, San Jose, Calif., assignor to Pacific Western Systems, Inc., Mountain View, Calif.

Filed Dec. 20, 1978, Ser. No. 971,209
Int. Cl.³ C23C *13/08*
U.S. Cl. 414—217 **9 Claims**



1. In a rotary vacuum sealed wafer transport system for transporting semiconductive wafers between ambient atmosphere and subatmospheric pressure within a wafer processing station:

wafer processing station means comprising an evacuable chamber for processing therein of semiconductive wafers at subatmospheric pressure;

said evacuable envelope of said wafer processing station means having at least one slot therein through which the wafers to be processed pass between the ambient atmosphere and the subatmospheric pressure within said processing station means;

said evacuable envelope having an external concave face portion intersecting with a generally planar external face portion and said slot being positioned generally at the intersection of said concave and planar face portions; and

deformable elastic roller means disposed for wiping sealing engagement with portions of said planar and concave faces of said evacuable envelope surrounding said slot for providing a gas tight seal of said slot while permitting passage of said wafers through said slot.

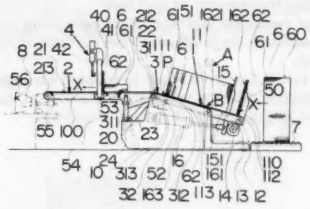
4,249,847

APPARATUS FOR TRANSPORTING BOARDS

Masateru Tokuno, Nishinomiya, Japan, assignor to Rengo Co., Ltd., Osaka, Japan

Filed Oct. 12, 1978, Ser. No. 950,681
Claims priority, application Japan, Oct. 24, 1977, 52-127724; Aug. 25, 1978, 53-104294
Int. Cl.³ B65G *57/28*
U.S. Cl. 414—330 **15 Claims**

1. In an apparatus for transporting boards, a first conveyor adapted to transport a large number of contiguous boards on edge in an upright position, said boards having front faces facing in the direction of their movement by said first conveyor and bottom edges resting on said first conveyor, means at the discharge end of said first conveyor for receiving bundles of boards from said first conveyor, and transfer means adjacent said discharge end of said first conveyor adapted to lift off said first conveyor and forwardly move the bottom edges of boards in a leading group of the boards being transported by said first conveyor whereby to lay said group of boards in a flat bundle at said receiving means with said front



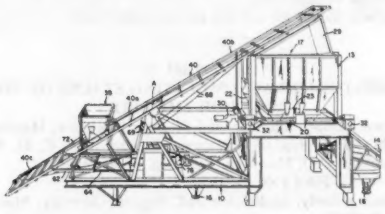
faces upward and said bottom edges forward in the direction of transport.

4,249,848

TRANSPORTABLE, COLLAPSIBLE VEHICLE LOADING HOPPER

Cecil A. Griffin, 5911 S. 129th, Seattle, Wash. 98178, and Gerald J. Des Jarlais, 16712 NE. 31st, Bellevue, Wash. 98008

Continuation of Ser. No. 873,107, Jan. 30, 1978, abandoned. This application Oct. 5, 1979, Ser. No. 82,118
Int. Cl.³ B65G *1/00*
U.S. Cl. 414—332 **8 Claims**



1. A transportable, collapsible vehicle loading hopper for filling trucks or the like with stickly substances like asphaltic mix or other sticky mixed product from a mixing device at a remote construction site, comprising:

a transportable frame supported on ground engaging wheels,

a vertically raisable one piece holding bin having a truncated lower portion terminating in a large discharge end adapted to be above a vehicle when the bin is in a raised position and below the vertical height clearance normally encountered on highways when in a lowered transporting position and an upper filling end adapted to be below the vertical height clearance normally encountered on highways when in said lowered transporting position, said rectangular bin lower truncated rectangular discharge end including at least two separate generally rectangular discharge openings, and a gate closing each said opening thereby increasing the flow area out of the bin without increasing vertical height of the discharge end, said combined discharge openings having a large area;

means for linearly vertically moving said bin within said frame so that the vertical axis of said bin remains parallel with the vertical axis of said frame, said bin being telescoped in a unitary unmodified condition between said raised position and said lowered transporting position such that the height of said frame and bin is reduced in said transporting position without increasing the length or width of said frame and bin,

mix delivery means extending from ground to above said bin when the bin is raised, and including means for transporting the mix from the mixing device to the upper filling end of the bin, and

means for collapsing the delivery means into a position supported solely on said frame but below said vertical height clearance.

4,249,849

CONVEYOR SYSTEM FOR ROD-LIKE ARTICLES

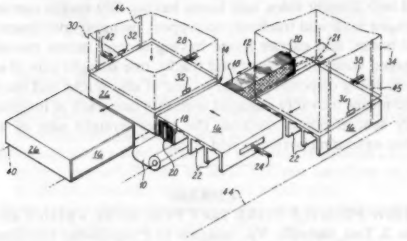
Dennis Hinchcliffe, London, England, assignor to Molins Limited, England

Filed Dec. 7, 1978, Ser. No. 967,102

Claims priority, application United Kingdom, Dec. 21, 1977, 53150/77

Int. Cl.³ B65G *47/52*

U.S. Cl. 414—404 **20 Claims**



1. A conveyor system for rod-like articles comprising at least one container; at least one container holder; conveyor means for moving rod-like articles in a direction transverse to their lengths into the container; retaining means for retaining said articles in the container; and means for moving the container relative to the retaining means in a direction parallel to the lengths of said articles, so that the container is at least partly inserted in said container holder which subsequently retains said articles in the container.

4,249,850

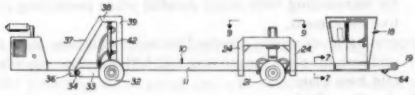
APPARATUS FOR LOADING, TRANSPORTING AND UNLOADING MODULES OF SEED COTTON AND THE LIKE

Donald W. Van Doorn; Roy T. Williams, and James B. Hawkins, all of Columbus, Ga., assignors to Lummus Industries, Inc., Columbus, Ga.

Filed May 30, 1978, Ser. No. 910,465

Int. Cl.³ B60P *1/38*

U.S. Cl. 414—491 **3 Claims**



1. In apparatus for picking up from the ground a mass of material such as a module of seed cotton,

(a) a vehicle having a single elongated frame disposed to function both as a chassis frame and a conveyor frame,

(b) conveyor elements mounted directly on the upper surface of said frame and disposed to receive the load to be handled,

(c) sets of fore and aft wheels for supporting the frame,

(d) means securing the frame against substantial vertical movement to a first set of said wheels,

(e) arms for the second set of wheels pivotally mounted adjacent one end to the frame, the wheels of said second set of wheels being mounted on said arms adjacent adjacent their opposite ends,

(f) a fluid pressure cylinder for each wheel of said second set of wheels operatively interposed between the frame and the wheel carrying ends of said arms whereby the frame adjacent said second set of wheels may be raised and lowered vertically relative thereto thus to lower one end of the conveyor substantially to ground level for the reception of a load to be lifted and moved, and

(g) fluid transfer means interconnecting one end of each cylinder with the corresponding end of the other cylinder, whereby when operating on uneven terrain torsional forces on the frame are substantially eliminated.

4,249,851

TRANSPORTER VEHICLE FOR VEHICLES AND CONTAINERS

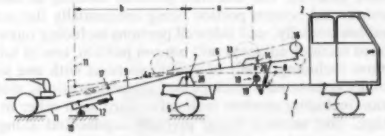
Franz X. Sedelmayer, Ferenc Juhasz, both of Munich, Fed. Rep. of Germany, assignor to Franz X. Sedelmayer, Munich, Fed. Rep. of Germany

Filed Sep. 6, 1978, Ser. No. 940,124

Claims priority, application Fed. Rep. of Germany, May 12, 1978, 2820919

Int. Cl.³ B60P *1/04*

U.S. Cl. 414—494 **9 Claims**



1. A transporter vehicle for vehicles and/or containers, and including a driver cab and a rear axle comprising:

a loading platform moveable between a transportation position to a loading position, positioned behind said driver's cab including a rear section thereof projecting in a cantilevered fashion beyond said rear axle of said vehicle adapted to be lowered to the ground into said loading position for loading of said vehicles and/or containers, and a front section positioned behind and adjacent said driver's cab in said transportation position wherein said rear section is bent downward with respect to said front section at a predetermined angle;

a push-pull unit mounted on said transporter vehicle and operatively connected to said front section of said loading platform;

tipping support means mounted on said transporter vehicle substantially directly above said rear axle for supporting said rear section wherein said rear section is bent downwards towards the ground at a second angle when in said loading position and wherein said rear section is also bent downward with respect to said front section substantially directly above said rear axle;

at least one tail wheel mounted to said rear section at a rearward, free end portion thereof;

said rear section further comprising a tiltable, drive on ramp upon which said vehicles and/or containers are mountable in said loading position;

trailer coupling means directly connected to said tipping support means; and

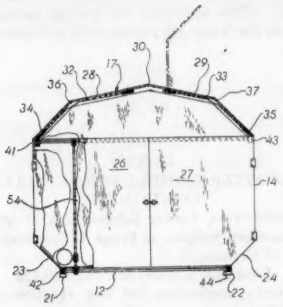
at least one stationary wheel box mounted on a front end portion of said front section wherein the length of said loading platform from a middle portion of said at least one stationary wheel box to said tipping support means is approximately 2.1 m and the length from said tipping support means to an end portion of said rear section is approximately 2.5 m.

4,249,852

STORAGE APPARATUS

John A. Alstad, P.O. Box 418, Sunburst, Mont. 59482

Filed Dec. 18, 1978, Ser. No. 970,350
Int. Cl.³ B65F *3/28*
U.S. Cl. 414—514 **4 Claims**



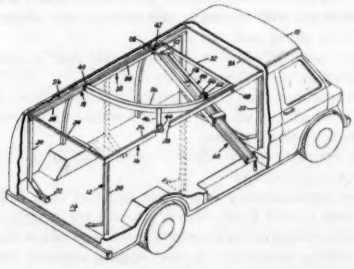
1. Storage apparatus including a supporting frame, a bottom portion, sidewall portions, end portions and a roof portion, said bottom, sidewall, end and roof portions forming an enclosed chamber, said bottom portion being substantially flat and disposed horizontally, said sidewall portions including outwardly inclined sections adjacent said bottom portion, one of said end portions including a pair of mating sections with one section pivotally connected to each of said sidewall portions, said roof portion including sections inclined toward each other to form a ridge, said sections being pivotally connected along said ridge, counterbalancing means including biasing means operatively connected to said pivotally connected sections of said roof section, a movable member vertically disposed within said chamber substantially parallel to said end portions normally disposed remote from said pivotally connected end portion and movable toward same, means for moving said movable member including roller chain means disposed adjacent substantially the full length of the junctures of said roof portion with said sidewall portions and disposed adjacent substantially the full length of the junctures of said sidewall portions with said bottom portion, and drive means including a gear reducer and a chain and sprocket combination operatively connected to said movable member through said roller chain means.

4,249,853

APPARATUS FOR LOADING AND UNLOADING A VEHICLE

Daniel L. Lyvers, 3331 Kirkfield Dr., Fort Wayne, Ind. 46805

Filed Apr. 16, 1979, Ser. No. 30,086
Int. Cl.³ B60P *1/54*
U.S. Cl. 414—543 **8 Claims**



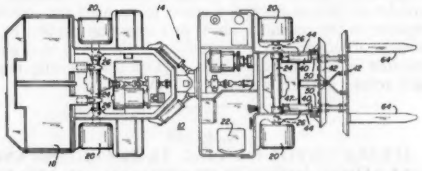
1. Apparatus for loading and unloading a vehicle comprising a supporting frame having a pair of parallel spaced horizontally extending elongated tracks supported near the ends thereof by upstanding legs and elongated cross members operatively secured to said tracks adjacent the upper ends of said legs thereby defining a loading space within said frame; a hoist carrier frame mounted on said tracks for movement longitudinally thereof, said carrier frame lying substantially within the plane of said tracks to be disposed at the top portion of said space; a hoist boom pivotally connected to said carrier frame adjacent one of said tracks, said boom extending horizontally beneath said carrier frame and swingable across said space between said tracks, said carrier frame including elongated elements secured together in the shape of a sector of a circle, the arcuate portion of said carrier frame serving as a trackway, said pivotal connection being adjacent to the apex formed by said two straight sides, said boom having first means movably engaged with said trackway to support swinging movement of said boom, said carrier frame having second means movably engaged with the other of said tracks, one straight side of said sector being disposed parallel to one of said tracks and having third means movably engaged with said one track at longitudinally spaced points thereon, the other straight side of said sector extending between said tracks.

4,249,854

LOW PROFILE FORK LIFT FOR MINE VEHICLES

John J. Teti, Saltville, Va., assignor to Pyott-Boone Machinery Corporation, Saltville, Va.

Filed Jan. 5, 1979, Ser. No. 1,152
Int. Cl.³ B66F *9/00*
U.S. Cl. 414—685 **15 Claims**



1. A low profile self-propelled rubber tired mine vehicle comprising:

a frame;

a base plate supported from the end of said frame;

a fork lift plate spaced apart from said base plate and disposed parallel thereto;

a pair of forks extending from said fork lift plate;

link means connecting said base plate and said fork lift plate for maintaining both plates parallel while permitting relative movement;

operating lever means disposed between said base plate and said fork lift plate for moving said fork lift plate relative to said base plate;

hydraulic cylinder actuating means connected to said frame and disposed behind said base plate having actuating rod means movable between an extended and a retracted position; and,

connecting means for connecting the actuating rod which extends through an opening formed in the base plate to said operating lever means.

4,249,855

METHOD FOR INTRODUCING SOLIDS INTO A SOLIDS UPFLOW VESSEL

Roland O. Dhondt, Long Beach, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed Sep. 12, 1979, Ser. No. 74,817
Int. Cl.³ B65G *25/04*; C10B *31/02, 47/22*
U.S. Cl. 414—786 **20 Claims**

1. A method for introducing particulate solids upwardly into

a solids upflow vessel containing a bed of particulate solids and having a bottom solids inlet, comprising the steps of:

(a) communicating with said solids inlet a feed cylinder at least partially filled with particulate solids and fitted with a piston axially reciprocatable within said feed cylinder;

(b) extending said piston upwardly to a first position thereby displacing at least a portion of the solids from said feed cylinder through said solids inlet into said solids upflow vessel;

(c) thereafter retracting said piston to a second position spaced a preselected distance below said first position

thereby relaxing said bed of particulate solids, said preselected distance being selected such that the retraction of said piston in step (c) substantially reduces the pressure between said piston and said solids;

(d) positioning a solids backflow prevention element directly below said solids inlet so as to prevent backflow of said solids downwardly through said solids inlet;

(e) thereafter further retracting said piston to a third position spaced below said second position; and

(f) transporting additional particulate solids from a solids feed reservoir and introducing said additional particulate solids into said feed cylinder.

4,249,856

CONTROL APPARATUS FOR AIR INTAKE IN OIL BURNERS OF HEATING BOILERS

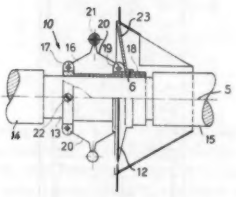
Tauno Aksola, Suomen, Järvelä, Finland

Filed Sep. 28, 1978, Ser. No. 946,657

Claims priority, application Finland, Oct. 3, 1977, 772914

Int. Cl.³ F01D *17/00, 17/12*

U.S. Cl. 415—25 **16 Claims**



1. Apparatus for controlling the air intake through an air intake aperture provided in an oil burner in a heating boiler, the boiler including an oil pump and a blower, each of which has a rotary driving member associated therewith, comprising:

a rotatably mounted coupling member adapted to be connected to at least one of said rotary driving members for rotation therewith, said coupling member further being adapted to extend substantially along the axis of the intake aperture;

a first sleeve member detachably mounted on said axially extending coupling member in a normally fixed relation thereto;

a second sleeve member mounted on said first sleeve member in coaxial relation thereto, said second sleeve member being axially slidable over said first sleeve member;

at least one spring member including a pair of leg portions extending obliquely in opposite directions with respect to each other and a central portion interconnecting respective inner ends of said leg portions, said central portion comprising means for holding a weight member, and the respective outer terminal ends of said leg portions each being connected to a respective one of said first and second sleeve members, said spring thereby interconnecting the same;

a weight member located within the holding means of said at least one spring member; and

a closure member affixed to said second sleeve member; whereby upon starting the boiler, with consequent rotation of said driving members, said closure member moves axially away from the air intake aperture opening the same due to the centrifugal force acting on said weight member and upon stopping the boiler with consequent stopping of said driving members, said closure member moves axially towards the air intake aperture closing the same under the force of said spring member.

4,249,857

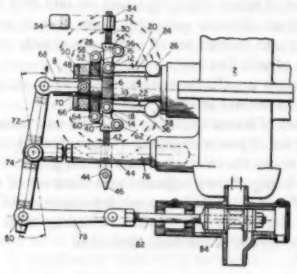
STEAM TURBINE GOVERNOR

Clyde F. Berry, R.F.D. 7, Box 169 C, Manchester, N.H. 03104

Division of Ser. No. 818,512, Jul. 25, 1977. This application Dec. 10, 1979, Ser. No. 102,233

Int. Cl.³ F01B *17/06*

U.S. Cl. 415—36 **4 Claims**



1. A steam turbine governor comprising a plurality of bell cranks mounted on pivots fixed to and spaced about the turbine shaft, each said crank mounted so as to swing in a plane that extends generally parallel to said shaft,

the first arm of each said crank having thereon a fixed flyweight,

the second arm of each said crank extending from said pivot substantially at right angles to said first arm,

each said second arm having a second weight mounted thereon by means permitting axial adjustability of said second weight,

said turbine shaft having a cylindrical extension beyond said pivots,

a bushing slidably mounted on said extension,

means including linkages connecting each said second arm with said bushing, whereby when said cranks are swung outward by centrifugal force induced by rotation of said shaft, said bushing will rotate with said turbine shaft and will be caused to move along said extension,

a collar rotatably mounted on said bushing but axially secured thereto,

a steam valve, axially movable means for controlling the position of said valve,

pivoted means connecting said axially movable means with said collar,

whereby when said bushing is moved axially on said extension by movement of said cranks about said pivots said steam valve will be correspondingly moved.

4,249,858

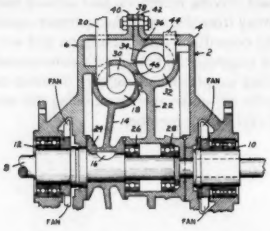
TURBINE WITH FREELY ROTATABLE ROTOR

Clyde F. Berry, R.F.D. 7, Box 169 C, Manchester, N.H. 03104

Continuation-in-part of Ser. No. 923,001, Jul. 10, 1978, abandoned. This application Dec. 10, 1979, Ser. No. 101,581

Int. Cl.[3] **F01D** *1/20, 1/22*

U.S. Cl. 415—64 **16 Claims**



1. A steam turbine comprising a housing,
a rotatable shaft carried by said housing,
a first rotor within said housing mounted on and fixed to said shaft,
a second rotor within said housing mounted for free rotation on said shaft,
a first set of steam engaging vanes on said first rotor,
a second set of steam engaging vanes on said second rotor which said second set of vanes are closely adjacent the vanes of said first rotor,
a first steam nozzle for supplying steam to act on the said first and second sets of vanes,
a third set of steam engaging vanes on said second rotor,
a fourth set of steam engaging vanes arranged circumferentially about the interior of said housing, said fourth set of vanes being closely adjacent said third set of vanes, and
a second steam nozzle for supplying steam to act on the said third and fourth sets of vanes whereby both said rotors will be driven in the same direction.

4,249,859

PRELOADED ENGINE INLET SHROUD

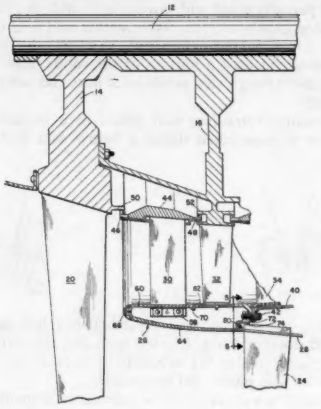
Alexander Benyi, Jr., Granby, Conn., and Joseph R. Kozlin, Jupiter, Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 27, 1977, Ser. No. 864,676

Int. Cl.[2] **F01D** *5/02;* **F02K** *3/02*

U.S. Cl. 415—79 **14 Claims**

1. A prestressed flow splitter in a turbofan engine projecting forwardly at the front of the engine for dividing ingested fan air between the compressor inlet and the fan duct comprising:
an annular shell structure surrounding the compressor inlet and having an annular inside wall defining the outer extremity of the compressor inlet duct and an annular outside wall defining the innermost limits of the fan duct surrounding the compressor inlet, the inside and outside walls being joined at the lip of the compressor inlet and having separate trailing portions extending axially rearward, the lip projecting forwardly and being unsupported at the leading edge of the splitter, and the trailing portions of the inside and outside wall being connected to the engine to support the forward projecting lip; and
load carrying means connected between the trailing portion of the inside wall and the trailing portion of the outside wall for axially preloading the inside wall in compression against the outside wall in the assembled condition of the



flow splitter, whereby the inside and outside walls are reactively stressed in the non-operative engine condition.

4,249,860

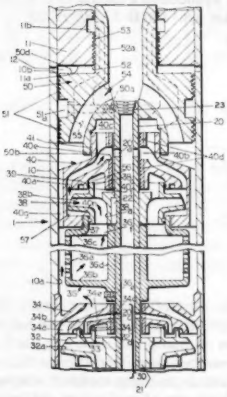
PUMPING APPARATUS FOR FLUIDS CONTAINING ABRASIVE PARTICULATES

John W. Erickson, Huntington Beach, Calif., assignor to Kobe, Inc., City of Commerce, Calif.

Filed Mar. 23, 1979, Ser. No. 23,210

Int. Cl.[3] **F04D** *29/06*

U.S. Cl. 415—111 **5 Claims**



1. An apparatus for pumping fluid containing abrasive particulates comprising: a generally cylindrical housing; a power driven shaft; a plurality of bearing means in said housing for journaling said shaft therein; said housing having inlet means for a particulate containing fluid at one axial end thereof; a first pump disposed in said housing adjacent said fluid inlet means and arranged to pressurize the particulate containing fluid to move said fluid axially through said housing; a centrifugal type particulate separating means mounted on said shaft to receive the pressurized particulate containing fluid from said first pump and operating to divide the said fluid into two axially moving fluid streams, one of the fluid streams being clean and relatively free of sand and the other fluid stream containing most of the particulate; a second pump operated by said shaft

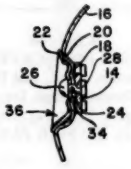
to increase the pressure of the clean fluid stream above that of the pressurized particulate containing fluid stream; conduit means for supplying said pressurized clean fluid to each of said bearings to thereby prevent the entrance of particulate containing fluid into said bearings, each of said first and second pumps having axially extending fluid sealing means mounted between the stationary and rotary portions of the pump; second conduit means for supplying a portion of said pressurized clean fluid to each of said fluid sealing means; a cylindrical body secured to said shaft, said cylindrical body having a pair of axially opposed faces, one of said faces being exposed to the stream of particulate containing fluid; conduit means for exposing the other of said faces to a source of pressure, the difference in pressures imposed on said faces and the respective areas of said faces being proportioned to generate a net thrust force on said shaft approximately equal and opposite to the thrust force generated by said first and second pumps; an axially extending, labyrinth seal disposed between the peripheral portions of said cylindrical body and said housing; and third conduit means for supplying a portion of said pressurized clean fluid to the central portion of said labyrinth seal to thereby prevent the entrance of particulate containing fluid into said seal.

4,249,861

FAN BLADE REINFORCEMENT PLATE

Herbert N. Charles, Chatham, Canada, assignor to Canadian Fram Limited, Chatham, Canada

Filed Mar. 5, 1979, Ser. No. 17,673
Int. Cl.³ F04D *29/34*
U.S. Cl. 416—132 A **5 Claims**



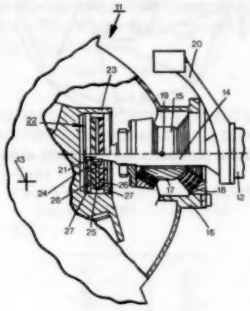
1. In a fan having a hub, an arm extending radially from said hub, a blade for said arm, and fastening means securing said blade to said arm, said fastening means including a rivet, said blade and said arm having aligned apertures receiving said rivet, and a reinforcing plate secured to said blade by said rivet when the blade is attached to the arm, said reinforcing plate having a free contour before installation of the plate on said blade different from the contour of the portion of the blade engaged by said plate when the plate and the blade are attached to the arm so that the plate is preloaded when it is secured to said blade, said rivet securing the plate to said blade and forcing a portion of the plate to assume the contour of said portion of the blade, said portion of the blade being depressed and cooperating with the rest of the blade to define a rim, said plate having a depression and a raised flange around at least a portion of the depression, said flange and said depression defining the free contour of the plate, said flange extending over the rim to cover the latter when the plate is installed on the blade, said rim and said depressed portion defining the free contour of said portion of the blade engaged by said plate, said rivet holding the depression on the plate against the depressed portion of the blade to force said raised flange of the plate against the rim of the blade, whereby bending forces are transferred through said plate away from said apertures.

4,249,862

DAMPER MEANS FOR HELICOPTER ROTORS

Alan Waddington, Somerton, and Alfred C. Martin, Shepton Mallet, both of England, assignors to Westland Aircraft Limited, Yeovil, England

Filed Dec. 5, 1977, Ser. No. 857,603
Claims priority, application United Kingdom, Dec. 8, 1976, 51308/76
Int. Cl.³ B64C *27/38*
U.S. Cl. 416—134 A **11 Claims**



1. A helicopter rotor including a rotor head and a plurality of rotor blades, means for supporting the rotor blades by the rotor head for rotation about an axis, each rotor blade supporting means comprising a spindle attached to the rotor blade, the spindle extending inwardly into the rotor head, a hollow elastomeric bearing for the rotor blade, the hollow bearing having a geometrical centre about which rotor blade flap and lead/lag movements occur during operation, and a generally annular elastomeric damper assembly for the rotor blade, the damper mounted on the rotor head generally transversely of a longitudinal axis of the spindle and being spaced apart axially from the elastomeric bearing, said spindle being operatively connected to said damper so as to be free to rotate about its axis relative the damper in response to feathering movements of the rotor blade and so that lateral movements of the spindle due to rotor blade flap and lead/lag movements are transmitted to the damper, whereby said damper provides controlled restraint of rotor blade movement in both the flap and lead/lag planes.

4,249,863

SURFACE AERATOR IMPELLER

John R. Connolly, Paoli; David E. Gibson, Ft. Washington; Edward L. Heimark, King of Prussia; Jerome B. Quinn, Kennett Square; Richard E. Speechley, Willow Grove, and Richard L. Winter, Berwyn, all of Pa., assignors to Philadelphia Gear Corporation, King of Prussia, Pa.

Division of Ser. No. 825,486, Aug. 17, 1977, Pat. No. 4,163,631. This application Apr. 9, 1979, Ser. No. 28,527
Int. Cl.³ B01F *3/04*
U.S. Cl. 416—185 **4 Claims**

1. A surface aerator impeller for aeration of liquids, said impeller comprising:

(a) a large flat horizontal upper disc;

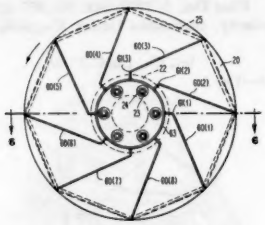
(b) means adapted for securing said disc to the lower end of a vertical rotatable drive shaft for rotation therewith about the center axis of said disc;

(c) a plurality of uniformly-shaped vertical impeller blades the upper edges of which are secured throughout their length to the underside of said disc at uniformly angular spacings about the center axis of said disc;

(d) each blade having inner and outer vertical edges;

(e) each blade being bent along a vertical line spaced from but relatively close to said inner vertical edge, forming each blade into minor and major flat portions disposed in

planes angularly disposed relative to each other, said minor flat portion lying in a radial plane, said major flat portion extending in a retreating direction relative to the direction of rotation of said disc;



(f) said major flat portion being flangeless and rectangular in shape.

4,249,864

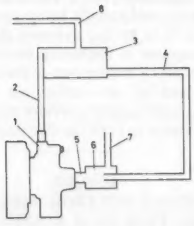
CENTRIFUGAL PUMP SYSTEM FOR WATER DESALINIZATION

Norman L. Foley, Modbury North, Australia, assignor to Auscoteng Pty. Ltd., Rose Park, Australia

Continuation of Ser. No. 792,677, May 2, 1977, abandoned, which is a continuation of Ser. No. 597,428, Jul. 21, 1975, abandoned. This application Jun. 19, 1978, Ser. No. 916,153

Int. Cl.³ F04B *23/14*

U.S. Cl. 417—77 **2 Claims**



1. A continuous vacuum pumping system comprising:

a. a centrifugal pump having an outlet and an inlet;

b. a separation chamber disposed above the level of said inlet;

c. an outlet conduit communicating between said pump outlet and said separation chamber;

d. a vacuum chamber having an inlet;

e. a recirculation conduit communicating between said separation chamber and said vacuum chamber and protruding into the vacuum chamber;

f. an inlet conduit communicating between said pump inlet and said vacuum chamber, with the protruding portion of said recirculation conduit being coaxial with and axially spaced from said inlet conduit, and with the interior sidewalls of said pump inlet conduit and said protruding portion being parallel to their mutual central axis;

g. whereby, a stream of liquid passing from said recirculation conduit to said inlet conduit and across a portion of said vacuum chamber will carry with it fluid passed into said vacuum chamber via said chamber inlet.

4,249,865

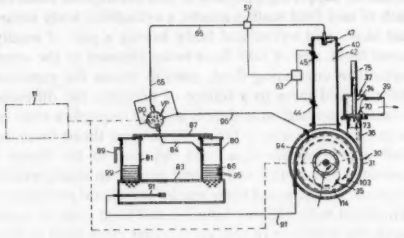
CONTROL MEANS FOR PREVENTING WATER OVERFLOW INTO VACUUM TYPE PRIMING PUMP

Albert H. Sloan, 4200 Kean Rd., Fort Lauderdale, Fla. 33314

Filed Jun. 25, 1979, Ser. No. 51,539

Int. Cl.³ F04D *9/00*

U.S. Cl. 417—200 **10 Claims**



1. In a well point pumping system which includes an impeller type pump, a vacuum chamber connected to receive water from said impeller type pump, and a vacuum pump connected to the upper end of said vacuum chamber for maintaining a vacuum in said vacuum chamber, in combination:

an electrically operated valve located between said vacuum pump and said vacuum chamber;

and electric control means for operating said valve, said electric control means comprising:

first means for sensing when the water in said vacuum chamber has risen to a predetermined high level and for effecting closure of said electrically operated valve;

and second means for sensing when the water in said vacuum chamber has fallen to a predetermined low level below said predetermined high level and for effecting opening of said electrically operated valve.

4,249,866

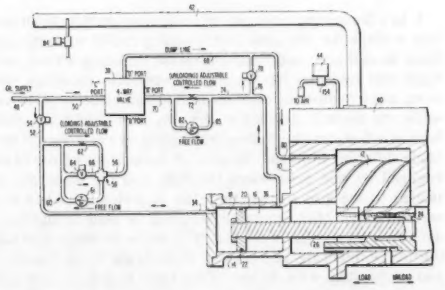
CONTROL SYSTEM FOR SCREW COMPRESSOR

David N. Shaw, Unionville, Conn., and David J. First, Carlisle, Mass., assignors to Dunham-Bush, Inc., West Hartford, Conn.

Filed Mar. 1, 1978, Ser. No. 882,468

Int. Cl.³ F04B *49/02*

U.S. Cl. 417—280 **27 Claims**



1. In a screw air compressor system having a compressor section, a motor for driving said rotors, an output reservoir for compressed air and an output line associated with said reservoir, a slide valve movable relative to said compressor rotors for varying the output of said section and a hydraulic piston and cylinder assembly, said piston dividing said cylinder into an inboard and an outboard section and coupled to said side valve, the improvement comprising:

an input source of hydraulic fluid;

valve means connected to said cylinder assembly, wherein said valve means has four ports, a first port selectively engageable for receiving hydraulic fluid from said input source, a second port selectively engageable with the outboard section of said cylinder assembly, a third port selectively engageable with the inboard section of said cylinder assembly, a fourth port selectively engageable with a drain line and means on said valve means for effecting the opening and closing of said ports;

means for sensing the output air pressure in said output line;

means for sensing input loading of said motor;

a control circuit coupled to said valve means and responsive to both said means for sensing pressure and said means for sensing input loading to selectively pulse said valve means to thereby move said piston and vary the output of said compressor; and

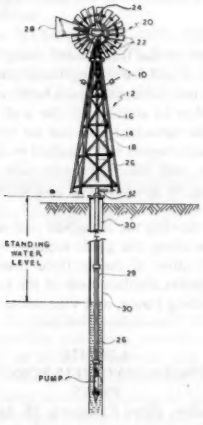
a two-way coupling between said second port and said outboard section, said two-way coupling defining a first flow path through a restrictor section from said second port to said outboard section and a second flow path parallel to said first path and having a boost valve therein, whereby when said boost valve is open, fluid communication from said outboard section to said second port is established.

4,249,867

WINDMILL HAVING COUNTERBALANCING MECHANISM

Donald F. Cunningham, Carefree, Ariz., assignor to Springhurst Technologies Corp., Bedford Hills, N.Y.

Filed May 14, 1979, Ser. No. 38,637
Int. Cl.³ F04B *17/02*
U.S. Cl. 417—334 **14 Claims**



1. A windmill for pumping water from a well having a casing extending into the earth and a liquid column within said casing, comprising:

a tower including a plurality of beams;

a rotor mounted near the top of said tower and adapted for rotating in the presence of wind;

a pumping rod extending into the casing of the well;

means operatively connected between said rotor and said pumping rod for converting rotational movement of said rotor into reciprocal motion of said pumping rod, and

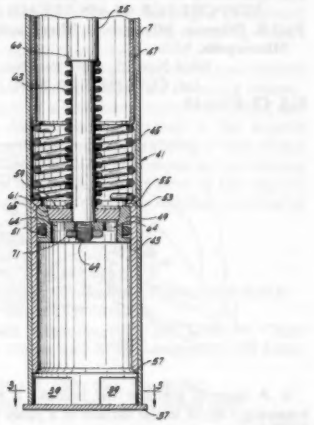
counterbalancing means for counterbalancing the weight of said pumping rod and the weight of a liquid column within the well casing in which the pumping rod is adapted to reciprocate including a first support member rigidly secured to said pumping rod, first and second cores within said first support member; first and second pivotable members having, respectively, first and second cylindrically shaped portions extending within said cores, respectively, and pivotable therein, and first and second bores substantially perpendicular to said cylindrically shaped portions; first and second rods having portions thereof slidably positioned, respectively, within said bores; third and fourth pivotable members pivotably secured, respectively, to horizontal beams on opposite sides of said tower, said first and second rods having end portions fixedly secured, respectively, to said third and fourth pivotable members; and counterbalancing weights fixedly secured to said third and fourth pivotable members, respectively, said weights adapted for counterbalancing the weight of said pumping rod and said liquid column.

4,249,868

PUMP FOR HIGH VISCOSITY LUBRICANTS WITH IMPROVED PRIMING FEATURE

Jeffery M. Kotyk, St. Louis, Mo., assignor to McNeil Corporation, Akron, Ohio

Filed Feb. 5, 1979, Ser. No. 9,541
Int. Cl.³ F04B *7/04, 21/04*
U.S. Cl. 417—511 **15 Claims**



1. A pump for pumping lubricant or other material comprising:

a pump tube adapted to be placed in a container holding a supply of material to be pumped with the tube extending down toward the bottom of the container, said tube having a head at its upper end with a material outlet in said head, said tube being closed at its lower end and having at least one lateral inlet adjacent its closed lower end for entry into the tube of lubricant or other material to be pumped,

a valve member slideable up and down in the tube between a lowered closed position blocking the inlet and a raised open position unblocking the inlet,

spring means in the tube biasing the valve member down to its closed position,

a piston rod having a sealing fit in the head and extending down into the tube,

a piston on the lower end of the rod,

the rod being movable up and down in the tube to move the piston through an upstroke from a lowered position adjacent the lower end of the tube to a raised position, and down from the raised position through a downstroke,

the piston being engageable with the valve member on each upstroke of the piston after an interval of lost motion as the piston moves up from its lowered position to lift the valve member from its closed to its open position, the

valve member remaining down in its lowered position until the engagement of the piston with the valve member, the piston thereby developing a vacuum in the pump tube during said lost motion interval, the piston allowing the valve member to move down to its closed position under the bias of said spring means when the piston moves down through a downstroke from its raised position, the piston continuing to move down after the valve member reaches its closed position,

said piston having a passage therethrough for flow of lubricant from below the piston to above the piston as the piston moves down through a downstroke and having a check valve for said passage adapted to open on a downstroke and close on an upstroke of the piston,

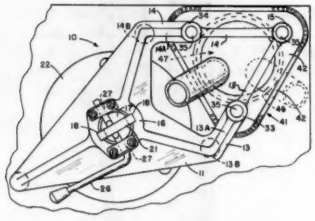
whereby on a downstroke the valve member moves down to close the inlet and the piston forces material through the passage in the piston and whereby on an upstroke the piston forces material out the outlet, develops said vacuum, and then moves the valve member up to open the inlet for entry of material to prime the tube below the piston.

4,249,869

SUPPORT FOR GLASS REPAIR APPARATUS

Paul S. Petersen, Minnetonka, Minn., assignor to Novus Inc., Minneapolis, Minn.

Filed Nov. 27, 1979, Ser. No. 97,822
Int. Cl.[3] B29F *5/00*; B29C *11/00*
U.S. Cl. 425—13 **7 Claims**



1. A support member for holding a repair assembly for repairing a break in the surface of a panel in position over the break to be repaired, said support comprising a frame, means to support said frame on the surface of the panel, said frame having a pair of arms cantilevered therefrom and spaced from the surface of the panel, and means on said arms to hold said repair assembly against the surface of the panel with portions of the repair assembly, wherein said means to hold said repair assembly on said arms comprises at least three attachment points arranged in a symmetrical pattern about an axis substantially normal to the panel, and mating members on said repair assembly to permit said repair assembly to be rotationally positioned at preselected increments about the axis relative to said arms.

4,249,870

CLIMBING FRAMEWORK FOR ERECTING CONCRETE FORMS IN THE MANUFACTURE OF STRAIGHT OR CURVED REINFORCED CONCRETE WALLS

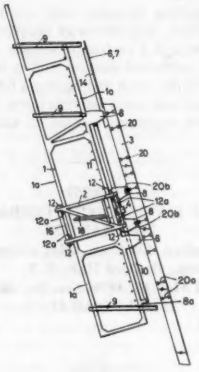
Wilfried Krabbe, Buchschlag, and Walter Simon, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Philipp Holzmann AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 29, 1978, Ser. No. 974,395
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1977, 2759088
Int. Cl.[3] B28B *19/00*
U.S. Cl. 425—63 **12 Claims**

1. A climbing framework and concrete form-erecting apparatus capable of erecting straight or curved reinforced concrete walls for tall buildings in a time saving and continuous work flow at a rapid building construction rate, comprising:

(1) a climbing framework including at least one scaffold tower, and at least one sliding frame for each scaffold tower; the sliding frame having vertical side walls within which the scaffold tower slides, and the scaffold tower and sliding frame being built as a spacious framework having an open interior and projecting from a wall on which they are mounted;

(2) means for removably attaching the scaffold tower and the sliding frame to a previously-erected wall portion, each independently of the other, for the form-erecting, reinforcing and concrete-pouring operation of the next wall portion;



(3) guide means on the framework along which each of the scaffold tower and the sliding frame can be moved reciprocably and independently, each with respect to the other, so that if either be attached to the wall while the other is detached, the detached one can be moved up or down along the guide means and attached to the wall in a different position, and the other can then be detached and moved along the guide means to a different position, and attached to the wall there; and

(4) means for moving the detached one with respect to the attached one along the guide means,

whereby the elevation of the scaffold tower along the wall results from a relative displacement of the scaffold tower with respect to the sliding frame, and vice versa.

4,249,871

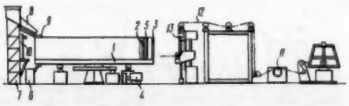
PLANT FOR PRODUCING REINFORCED-CONCRETE PIPES

Viktor V. Mikhailov, ulitsa Chkalova, 25, kv. 14; Alexandr K. Karakovsky, Novozykovsky proezd, 3, kv. 23; Petr Y. Dyachenko, Shosseinaya ulitsa, 40, kv. 126; Jury S. Ivanov, Zelenodolskaya ulitsa, 24, kv. 108; Igor V. Mikhailov, Zhivopisnaya ulitsa, 4, korpus 4, kv. 55; Mikhail G. Lunin, ulitsa Okskaya 22/2, kv. 9; Alexei V. Buyanov, Nizhegorodskaya ulitsa, 7a, kv. 50; Alexei A. Konstantinov, ulitsa Khlobystova, 20, korpus 2, kv. 30, all of Moscow; Anatoly S. Shagurin, ulitsa Uritskogo, 23, kv. 67, Ljubertsy Moskovskoi oblasti; Alexandr P. Kirillov, 2 Setunsky pereulok, 11, kv. 69, Moscow; Oleg V. Mikhailov, Chertanovo, ulitsa Krasny Mayak, 8, korpus 2, kv. 361, Moscow, and Arkady S. Khaimov, 4 Veshnyakovsky proezd, 7, kv. 48, Moscow, all of U.S.S.R.

Filed Aug. 27, 1979, Ser. No. 70,144
Claims priority, application U.S.S.R., Oct. 3, 1978, 2665134
Int. Cl.[3] B28B *23/14*
U.S. Cl. 425—111 **3 Claims**

1. Apparatus for producing reinforced concrete pipes particularly those of a large diameter comprising, a horizontal plat-

form, means pivotally mounting the platform for rotation about an axis means for selectively rotating the platform about said axis, said platform having an upper surface for receiving an assembly of a mold thereon having an annular mold cavity with an open upper end for filling and defined by a core member and a removable mold form circumferentially of said mold core, means for automatically inserting elongated inserts axially into said mold cavity disposed spaced in a circumferential direction axially parallel with the axis of the mold for forming



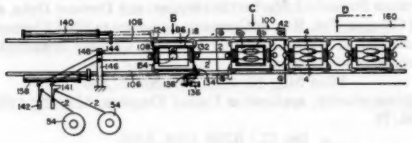
through axial openings in the wall of a pipe molded in said mold and removal thereof before concrete is fully set in said mold cavity, means for filling said mold cavity with concrete through said open upper end, means to smoothen the concrete at said open upper end during rotation of said platform thereby to smoothen the corresponding end of a pipe molded in said mold and means operative during rotation of said platform to wind reinforcing wire circumferentially about the concrete pipe with the core in place after removal of the mold form and the wire extending axially of the pipe.

4,249,872

APPARATUS FOR PRODUCING FOAMED PLASTIC TYPE CORK LINES

Seishiro Akaura; Yasushi Nagamune, and Takeshi Nakamura, all of Settsu, Japan, assignors to Ashimori Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 791,649, Apr. 27, 1977, Pat. No. 4,152,798. This application Jan. 12, 1979, Ser. No. 2,970
Claims priority, application Japan, Apr. 27, 1976, 51/48739
Int. Cl.[3] B29D *27/00*
U.S. Cl. 425—111 **34 Claims**



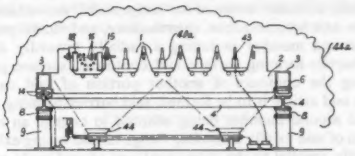
1. An apparatus for producing cork lines which comprises:
means for sequentially stretching portions of at least one flexible leader at definite intervals and having definite lengths, to prevent contraction thereof;
at least one molding means including at least one molding cavity, each of which is defined by a pair of closed molds, said closed molds also defining furrows disposed at the junctional surface edges of said molds;
means for sequentially introducing said stretched portions intermittently into said at least one molding cavity, said stretched portions being held by said furrows at said junctional surface edges of said molds;
means for injecting a foamable molten synthetic resin into said mold cavity and around said leader while maintaining said leader in a stretched state, said resin being molded and foamed into a float fixed around said leader;
means for opening said molds to remove the float from the molds after at least the surface of said float has been cooled;
means for cooling the interior of said float while maintaining said leader in a stretched state to prevent shrinkage thereof; and
means for releasing said leader from the stretched state.

4,249,873

MANUFACTURE OF PRESTRESSED PRODUCTS

Jean Louis J. Feuillade, Cagnes, France, assignor to B. M. Costamagna et Cie, Cagnes, France

Continuation of Ser. No. 830,058, Sep. 2, 1977, abandoned. This application Mar. 14, 1979, Ser. No. 20,351
Claims priority, application France, Mar. 28, 1977, 77 09136
Int. Cl.[3] B28B *23/04*
U.S. Cl. 425—111 **32 Claims**



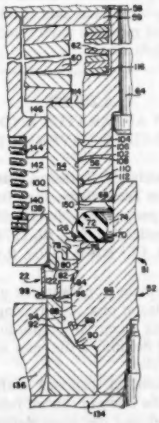
1. Apparatus for use with a prestressing means in the manufacture of elongated prestressed concrete products comprising:
a plurality of independent modules disposed end to end, each of said modules including a plurality of molds disposed side by side, each said mold for holding a prestressed product, each of said modules including mounting means,
support means for the said modules,
and damper means attached to said support means between a respective module and its respective mounting means,
said mounting means of a respective module mounting said module on the damper means attached to the support means while permitting longitudinal sliding of each of said modules with respect to the support means and preventing lateral sliding of a module with respect to the support means, said damper means providing isolation to vibration between the modules.

4,249,874

INSERT MOLDING APPARATUS WITH MOVABLE FLASH BARRIER

Jerry D. Reichenbach, Carpentersville, and Keith W. Christiansen, Fox River Grove, both of Ill., assignors to CR Industries, Elgin, Ill.

Filed Oct. 1, 1979, Ser. No. 80,542
Int. Cl.[2] B29F *1/00*; B29D *3/00*; B29H *9/00*
U.S. Cl. 425—127 **12 Claims**



1. An apparatus for molding an article having a body portion formed from a moldable material and bonded to a relatively rigid casing element having axially and radially extending

flange portions and a portion thereof which is adapted to be inserted into the cavity-forming part of said molding apparatus, said apparatus comprising, in combination, a first mold member having means thereon for receiving a prepared portion of a moldable material from which said body of said article is to be formed, a plurality of surfaces formed on said first mold member and at least partially defining the shape of a cavity in which said article is to be formed, and an insert support surface formed on said first mold member, said surface being adapted to receive and support a portion of said insert element, a second mold member mounted for reciprocable movement along a given axis between open, intermediate, and closed positions, said second member including a radially inwardly directed flash barrier-forming surface and contoured surface portions defining the contours of another portion of said cavity in which said article is to be formed, said barrier-forming surface on said second member being adapted to engage an exterior portion of said axially extending flange of said casing extending generally parallel to the movement axis of said mold member during movement thereof, and a land element on said second mold member for engaging a radially extending portion of said insert element in fluid tight relation, the shape of said article-forming cavity being completely defined when said second member is in said closed position thereof, when said insert is resting on said support portion of said first mold member whereby the axially extending portion forms a part of the cavity, and when said radial extending portion of said insert is engaged by said land portion, and a third mold member including surfaces cooperating with said first member in one position thereof to define a region for receiving a charge of moldable material, said third member having a face portion adapted to engage said prepared charge of moldable material and move said charge of material into the interior of said molding cavity, a reciprocable mold plate and first and second resilient means disposed respectively between said plate and said second and third members, said plate being movable along said axis between open and closed positions and adapted, in the closed position thereof, to urge said first and second resilient means and said second and third mold members associated therewith into the closed positions thereof, said mold members and said resilient means being constructed and arranged so that, during downward movement of said second mold member, said barrier-forming surface thereof engages and travels along said exterior surface of said axially extending casing flange in fluid-tight relation, until a part of said second member engages said radial flange of said casing, and so that initial movement of said mold plate to said closed position moves said third member into contact with said moldable material and subsequent movement of said mold plate causes said third member to transfer said material into said molding cavity under a force regulated by said second resilient means.

4,249,875

CO-EXTRUSION APPARATUS AND METHOD FOR PRODUCING MULTIPLE-LAYERED THERMOPLASTIC PIPE

Edward Hart, and Raleigh N. Rutledge, both of Big Spring, Tex., assignors to Cosden Technology, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 812,041, Jul. 1, 1977, abandoned. This application Sep. 15, 1978, Ser. No. 942,792

Int. Cl.[3] **B29D** *23/04, 9/00*

U.S. Cl. 425—133.1 **17 Claims**

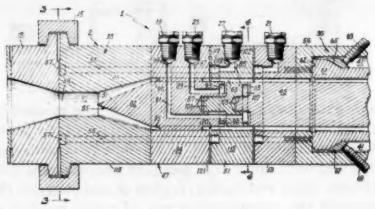
13. A balanced flow die apparatus for manufacturing multiple-layered thermoplastic pipe, comprising:

a. a die body having a central longitudinal passage, one end of said die body defining a die inlet and the opposite end defining a die outlet;

b. a cylindrical mandrel disposed within the longitudinal passage of said die body in spaced relationship therewith, said mandrel and said die body defining thereby a main extrusion passageway, and said mandrel having a tapered head facing said die inlet for converting a cylindrical solid stream of thermoplastic into an annular stream;

c. an inner laydown means disposed within said mandrel for applying a layer of thermoplastic to the inner surface of said annular stream of thermoplastic;

d. an outer laydown means disposed in said die body circumferentially about said main extrusion passageway for applying a layer of thermoplastic to the outer surface of said annular stream of thermoplastic, each of said inner and outer laydown means comprising an annular radial orifice communicating with said main extrusion passageway, an annular feed ring supplying thermoplastic to said orifice,



and a pressurebalanced annular reservoir chamber connected to said annular feed ring for balancing the flow of thermoplastic through said orifice;

e. means for feeding thermoplastic to each of said inner and outer laydown means; and

f. a sleeve secured within said die body outlet and a spindle secured to said mandrel in end-to-end relation therewith; said sleeve and spindle forming an extended extrusion passageway wherein the layers of thermoplastic are stabilized before exiting the die.

4,249,876

CONTROL OF PLASTICS EXTRUSION

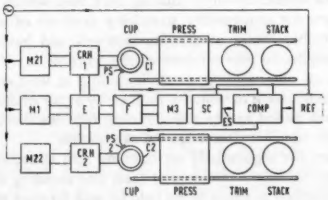
Hermann Strausfeld; Herbert Schloesser, and Dietmar Dehn, all of Cologne, Fed. Rep. of Germany, assignors to EMI Electrola Gesellschaft mit beschrankter Haftung, Cologne Braunsfeld, Fed. Rep. of Germany

Filed May 10, 1979, Ser. No. 37,870

Claims priority, application United Kingdom, May 20, 1978, 20938/78

Int. Cl.[3] **B29B** *5/04, 5/06*

U.S. Cl. 425—145 **5 Claims**



1. An extruder control arrangement comprising,

a feeder means having an adjustable feed rate for supplying a thermoplastics material to an extruder,

means for generating a reference signal indicative of a preset time period, sensing means for determining the actual time period for the extruder to deliver a measured quantity of extrudate and for generating a further signal indicative thereof,

means responsive to said reference and further signals for comparing said preset and actual time periods and for regulating the feed rate of the feeder means in dependence on the comparison, the feed rate being increased or de-

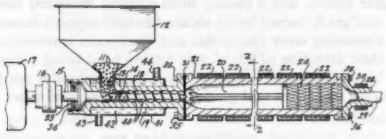
creased when the actual time period is respectively greater than or less than the preset time period.

4,249,877

HIGH-SPEED DIRECT-DRIVE EXTRUDER

James F. Machen, 2495 Robinwood Ave., Toledo, Ohio 43620

Filed Mar. 26, 1979, Ser. No. 23,546
Int. Cl.³ B29F *3/02*
U.S. Cl. 425—204 **10 Claims**



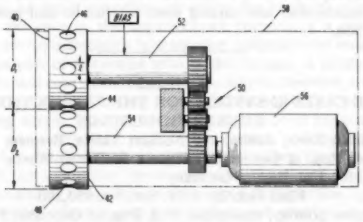
1. A plastic extruder of the type described comprising:
a cool bore;
a raw material inlet for said bore;
a non-plasticating feed screw in said cool bore;
said screw rotatable in said cool bore such that the maximum screw RPM times the square root of the screw diameter in inches equals at least 500;
the length to diameter ratio of said screw being less than 16 to 1;
said cool bore communicating with a heated-wall melting chamber;
means in said melting chamber for conducting heat from said heated walls into a variety of portions of the material flow stream through said melting chamber;
mixing means also in said melting chamber downstream from said heat conducting means;
and, an extrudate outlet for said melting chamber.

4,249,878

BRIQUETTING PRESS

Karl R. Komarek, Chicago, Ill., assignor to K. R. Komarek, Inc., Elk Grove Village, Ill.

Filed May 10, 1979, Ser. No. 37,867
Int. Cl.³ A21C *3/00*
U.S. Cl. 425—237 **34 Claims**



1. In a pair of briquetting press rolls for synchronized rotation in tangential relationship in opposite angular direction by a briquetting press, the improvement wherein:
first and second briquetting press rolls have diameters D_1 and D_2, respectively, and each has a plurality of briquette-forming cavities spaced about its periphery for registration and cooperation with the cavities of the other roll to form briquettes of particulate material during rotation of the rolls, the spacings of the cavities of said first and second rolls having a circumferential pitch L_1 and L_2, respectively,
said rolls conforming to the relationships

$$\frac{D_1\omega_1}{L_1} = \frac{D_2\omega_2}{L_2}, \text{ and}$$

$$\omega_1 D_1 \neq \omega_2 D_2,$$

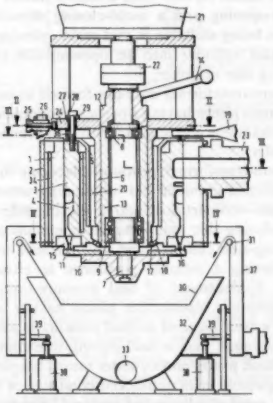
where ω_1 and ω_2 are the synchronized angular velocities of rotation of said first and second rolls, respectively, whereby a briquette being formed in a pair of said cooperating cavities is subjected to a combined compressive stress and shear stress for increasing the strength and density of the briquette.

4,249,879

GRANULATING APPARATUS

Dietmar Anders, and Jurgen Voigt, both of Hanover, Fed. Rep. of Germany, assignors to Hermann Berstorff Maschinenbau GmbH, Hanover Kleefeld, Fed. Rep. of Germany

Filed Jun. 12, 1979, Ser. No. 48,175
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1978, 2825639
Int. Cl.³ A01J *21/02*
U.S. Cl. 425—311 **11 Claims**



1. Apparatus for granulating plastics melt and other materials comprising a granulating head; a cutting plate mounted on said granulating head; a cutting tool having a plurality of blades spaced a predetermined distance from and cooperating with said cutting plate and defining therewith a cutting plane; a shaft to which said blade holder is mounted for rotation, and drive means for rotating said shaft; a housing enclosing said granulating head, and means in said housing for cooling and conveying cut granules; a guide sleeve to which said cutting plate is secured; a bearing housing around said shaft and within said guide sleeve, and a fixed bearing around and supporting said shaft; a centering ring disposed approximately in said cutting plane and supporting said bearing housing, the arrangement being such that said cutting plate, said blade holder and said cutting blades, and said retaining ring are approximately in said cutting plane, whereby expansion of the material of said components due to the heat of the melt is compensated for so that the predetermined distance between said blades and said cutting plate can be continuously maintained.

4,249,880
MOLD-CLOSING DEVICE FOR AN INJECTION-MOLDING MACHINE

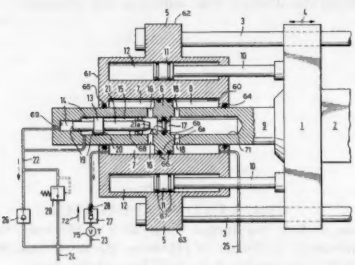
Walter Wohlrab, Weissenburg, Fed. Rep. of Germany, assignor to Krauss-Maffei Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 3, 1979, Ser. No. 99,895

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1978, 2852516

Int. Cl.³ B29F *1/06*

U.S. Cl. 425—451.2 **9 Claims**



1. A mold-closing device for an injection-molding machine having a movable mold-carrying plate, said mold-closing device comprising:

a main piston connected to said plate;

support means formed with a main cylinder extending in a mold-opening and a mold-closing direction, said main piston being shiftable in said main cylinder and subdividing said cylinder into an opening-side chamber and a closing-side chamber;

a pressure-transformer cylinder formed in said main piston, said main piston having a passage communicating between said chambers and aligned with said pressure-transformer cylinder;

a pressure-transformer piston displaceable in said pressure-transformer cylinder and subdividing same into an opening-side compartment and a closing-side compartment, said closing-side compartment communicating with said opening-side chamber and said pressure-transformer piston having a member positioned to close said passage upon displacement of said pressure-transformer piston said pressure transformer piston having larger effective surface area disposed to fluid pressure in said opening-side compartment than in said closing-side compartment;

rapid-action piston-and-cylinder means coupled to said plate and operable in an unblocked condition of said passage to effect rapid mold-opening and mold-closing movement of said plate; and

respective conduit means connecting said opening-side chamber and said-opening-side compartment in parallel to a common pressure line.

4,249,881
STATION FOR RUNNING FOAM-PLASTICS MATERIAL INTO SHUT MOLDS

Othmar Oppl, Hergensweiler, and Hermann-Siegfried Jaeger, Lindau, both of Fed. Rep. of Germany, assignors to Admiral Maschinenfabrik GmbH, Lindau, Fed. Rep. of Germany

Filed Aug. 20, 1979, Ser. No. 67,765

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1978, 2838079

Int. Cl.³ B29D *27/04*

U.S. Cl. 425—543 **7 Claims**

1. Apparatus for feeding a foamable plastic mix into successively advancing shut molds having filling apertures, wherein said molds are advanced along a predetermined line of travel by mold transports forming part of a conveyor system, said apparatus comprising

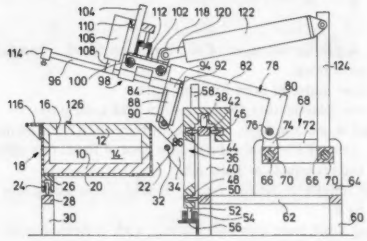
a mixing head carriage reciprocable in a direction parallel to the line of travel of the molds;

support means mounted on said carriage and pivotable between raised and lowered positions relative to said molds and transports;

first means operatively associated with each mold and mold transport adapted to engage said support means in the lowered position thereof whereby said carriage is advanced with said transport;

guide means, and a mixing head slidably mounted thereon, said guide means being secured to said support means and extending over the molds and transports transversely of their direction of travel, said mixing head being reciprocable on said guide means between inner and outer positions;

second means on said guide means defining said inner position of said mixing head and other means operatively associated with each mold and transport defining said outer position of said head on said guide means, said mixing head having an outlet which registers with a filling aperture of a mold when said mixing head is at said outer position;



first actuator means providing axially reciprocable driving power connected between said mixing head and carriage, said actuating means moving said mixing head outwardly on said guide means with extension of said actuator means and conversely moving said mixing head inwardly toward said inner position during retraction, said actuator means further causing said support means to be pivoted to its raised position, disengaging said first means and interrupting further travel of said carriage with each said mold and transport, upon continued retraction of said actuator means after said mixing head reaches its said inner position.

4,249,882
DIE CASTING SYSTEM FOR THE PRODUCTION OF RUBBER MOULDINGS

Friedrich Koch, Achim, and Norbert Thiele, Bremen, both of Fed. Rep. of Germany, assignors to Desma-Werke GmbH, Achim, Fed. Rep. of Germany

Filed Oct. 20, 1978, Ser. No. 953,300

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1977, 2750232

Int. Cl.³ B29H *3/08*

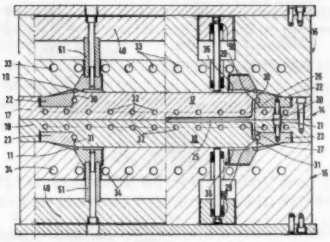
U.S. Cl. 425—547 **12 Claims**

1. A pressure die casting system for producing rubber mouldings and including at least one heated mould section and at least one cooled mould section, said mould sections forming a mould cavity therebetween, the improvement comprising:

(a) heating means associated with at least one mould section,

(b) cooling means associated with at least one mould section for exclusively retaining said rubber moulding adhesively attached to said cooled mould section upon separation of said cooled mould section and said heated mould section, said adhesive attachment to said cooled mould section being achieved solely by means of the cooled mould sec-

tion being maintained at a lower temperature than said heated mould section, and



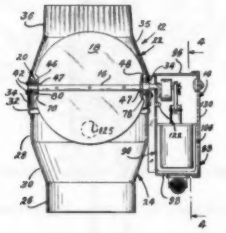
(c) ejector means associated with said cooled mould section for removing said rubber moulding therefrom after said separation of said cooled mould section and said heated mould section.

4,249,883

AUTOMATIC DAMPER DEVICE

Charles E. Woolfolk, Clarksdale, Miss., assignor to Save Fuel Corporation, Clarksdale, Miss.

Filed Jun. 20, 1977, Ser. No. 808,137
Int. Cl.³ F23N *3/00*
U.S. Cl. 431—20 **3 Claims**



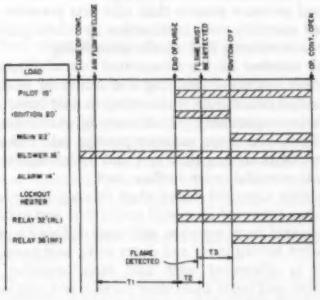
1. In a device to control the discharge of the products of combustion from a furnace or like device which has a burner and means including a solenoid operated control valve to control the supplying of fuel to the burner, the furnace also including an outlet tube through which the products of combustion can escape, the improvement comprising a damper control device including a tube member adapted to be installed in and as part of the outlet tube of the furnace, a reinforced means on said tube member to provide support therefor, a shaft journaled to the reinforcing means and having a first portion extending across the tube member and a second portion extending outwardly from said tube member, a damper plate attached to the first shaft portion and extending therefrom to adjacent the reinforcing means when in the closed position, means forming a crank arm on the second shaft portion, spring means operatively engageable with the crank arm biasing said crank arm and the shaft in a direction to move the damper plate away from the reinforcing means to an open position, motor means operatively connected to the crank arm for moving the damper plate from an open position away from the reinforcing means when said motor means is energized, switch means having an actuating member operatively engageable with the crank arm, said switch means going from one position when the damper plate is in an open position to a different position when the damper plate is in a closed position, said spring means effecting movement of said damper plate to an open position whenever said motor means is de-energized, the furnace cycling being controlled by thermostatically controlled switch means and a relay having a relay coil and relay contacts, means connecting the relay coil in series with the thermostatically controlled switch means whereby the relay coil is energized whenever the thermostatically controlled switch means are closed, said relay contacts including first relay contact means in circuit with the motor means for energizing the motor means, and second relay contact means in circuit with the solenoid operated control valve means on the furnace to enable energizing of the valve means whenever the relay coil is energized.

4,249,884

BURNER CONTROL APPARATUS WITH STABILIZED PILOT FLAME TIMING INTERVAL

Phillip J. Cade, Winchester, Mass., assignor to Electronics Corporation of America, Cambridge, Mass.

Filed Dec. 27, 1977, Ser. No. 864,685
Int. Cl.³ F23N *5/00*
U.S. Cl. 431—31 **11 Claims**



1. Burner control apparatus for use with a fuel burner installation having an operating control to produce a request for burner operation, a flame sensor to produce a signal when flame is present in said fuel burner installation, and means responsive to said burner control apparatus for controlling fuel flow, said burner control apparatus comprising:

a control device for actuating said fuel control means;

electronic accumulator timing circuit means operable for providing first and second successive timing periods of precise duration to provide a pre-ignition timing interval and an ignition timing interval;

means responsive to a request for burner operation to initiate an ignition sequence by actuating said timing circuit;

circuitry responsive to said actuated timing circuit for energizing said control device at the end of said first timing interval to initiate ignition and pilot fuel supply for said burner;

flame signal responsive circuitry responsive only during said ignition timing interval to detection of a flame signal from said flame sensor to deactuate said timing circuit means and initiate a third timing interval which extends beyond the normal end of said ignition timing interval; and

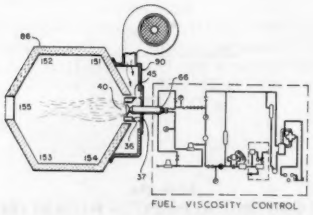
means responsive to the end of said third timing interval for initiating main fuel supply to said burner and terminating said ignition.

4,249,885

HEAVY FUEL OIL NOZZLE

Richard B. Reich, Streamwood, Ill., assignor to Vapor Corporation, Chicago, Ill.

Division of Ser. No. 693,138, Jun. 7, 1976, Pat. No. 4,141,505.
This application Jul. 20, 1978, Ser. No. 926,186
The portion of the term of this patent subsequent to Feb. 27, 1996, has been disclaimed.
Int. Cl.[3] F23N *1/00*
U.S. Cl. 431—38 **12 Claims**



1. A combustion system for liquid fuel having in combination;

a combustion air source,

a fluid source for supplying atomizing fluid at a first pressure,

a combustion chamber,

a liquid fuel source for supplying non atomized fuel at a second pressure greater than said first pressure,

a burner assembly with combustion air inlets ignition means and an atomizing fuel nozzle comprising;

an inner member having a truncated conoidal outer surface, an inner surface containing a plurality of passages with inner and outer ends terminating in said inner and outer surfaces respectively, for conveying pressurized atomizing fluid, said inner member passage inlets abutting said source of atomizing fluid and said outlet ends terminating in said conoidal outer surface; and

a truncated conoidal outer shell having outer and inner surfaces, mounted in spaced concentric and axial relationship to said inner member, said shell defining a plurality of passages having inner and outer ends, said passages essentially in alignment with said inner member passages, wherein said outer shell inner surface and said inner member outer surface define a fuel circulation cavity between said inner member outer surface and said outer shell inner surface, said cavity intersecting said inner member and outer shell passages at their respective outer and inner ends and communicating with said fuel source,

wherein the inner member and outer shell passages and fuel circulation cavity cooperate to propel fluid entrained liquid fuel particles from said outer shell passage outlet.

4,249,886

COMBUSTION CONTROL SYSTEM

Forest L. Bush, Mission Viejo, Calif., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 22, 1979, Ser. No. 41,448
Int. Cl.[3] F23K *5/00*; F23N *1/02*
U.S. Cl. 431—90 **4 Claims**

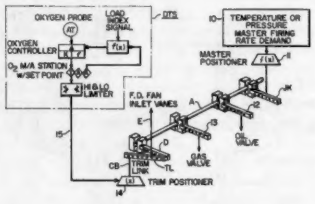
1. In a combustion apparatus supplied with fuel mixed with an intake of a combustive agent, the combination of:

a master member having an extremity movably mounted about a first axis for regulating the amount of fuel supplied;

a slave member having an extremity movably mounted about a second axis for regulating the amount of combustive agent intake;

a trim member positioned at a selectable angle relative to said master member and about the extremity thereof; and

an intermediate mechanical link connected between said trim member and said slave member for establishing said master-slave relationship through said trim member



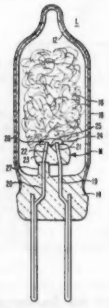
thereby to establish a fuel-to-combustible agent ratio which is a function of said selectable relative angle.

4,249,887

PHOTOFLASH LAMP HAVING GAP-FIRE IGNITION MOUNT, AND METHOD OF MAKING THE MOUNT

Aristide R. DeCaro, Edison, and Rudolf F. Strobel, Union, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 30, 1977, Ser. No. 866,154
Int. Cl.[3] F21K *5/02*
U.S. Cl. 431—365 **7 Claims**



1. In combination with a photoflash lamp that is adapted to be ignited by a voltage pulse and has a firing gap the length whereof affects the firing characteristics of the lamp and is thus desirably maintained within a predetermined dimensional tolerance, said lamp having a glass envelope that contains an oxidizing atmosphere and a mass of strand-like combustible fuel and is terminated at one end by an hermetic seal, means for igniting said fuel and producing a flash of light when a high-voltage pulse is applied to the lamp, said flash-ignition means comprising;

a pair of rigid lead-in wires embedded in said hermetic seal and extending into said envelope in spaced side-by-side relationship therewithin, the inner end portions of said wires being of substantially equal length and so arranged that the tips thereof are separated by a small gap having a length that is within said predetermined dimensional tolerance,

a single insulator within said envelope holding the lead-in wires in such gap-defining position, said insulator comprising a solid glass bead that is joined to medial parts of both of the lead-in wires and is so shaped that the tips of the wires protrude beyond the end face of the insulator bead toward the contained mass of fuel and the opposite face of the bead is spaced from the hermetic seal portion of the envelope,

a glass sleeve surrounding the part of only one of said lead-in wires that extends from said hermetic seal to said insulator

bead, said sleeve being fused to said bead and also to said hermetic seal and thus completely enclosing the said part of the lead-in wire so that only one of said pair of lead-in wires is electrically isolated from the mass of strand-like fuel and said sleeve also provides rigid support means for the insulator bead and the gap-defining tip portions of the lead-in wires, and

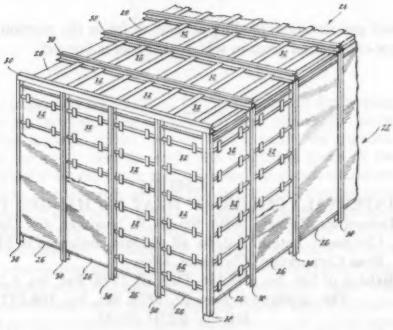
a layer of primer material disposed on and bonded to the end face of the insulator bead and completely covering the tips of said lead-in wires and extending into and filling the firing gap therebetween.

4,249,888

INDUSTRIAL FURNACE WITH CERAMIC INSULATING MODULES HAVING INTERNAL GRID SUPPORT

Ewald R. Werych, Elm Grove, Wis., assignor to General Signal Corporation, Stamford, Conn.

Filed Apr. 9, 1979, Ser. No. 28,084
Int. Cl.³ F27D *1/16, 1/06, 1/14*
U.S. Cl. 432—3 **9 Claims**



1. An industrial furnace used for heat treatment or the like and comprising:

panel means including a plurality of ceramic fiber insulating modules;

each of said modules having interiorly thereof a support frame with a plurality of interconnected rods embedded in situ in the ceramic fiber insulating body;

spaced means securely connected to said support frame and protruding outwardly through a surface of said insulating body which is remote from the interior of said furnace; and

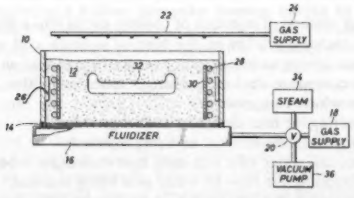
means secured to said spaced means for securing said modules to said furnace.

4,249,889

METHOD AND APPARATUS FOR PREHEATING, POSITIONING AND HOLDING OBJECTS

Willard E. Kemp, 14702 Broadgreen, Houston, Tex. 77079

Filed Jun. 5, 1979, Ser. No. 45,840
Int. Cl.³ F27D *3/00;* **F27B** *15/00*
U.S. Cl. 432—11 **32 Claims**



1. Method for positioning an irregular object over a wide range of object alignment positions and securely holding the object in a selected alignment position, comprising

embedding the object in a bed comprised of small granular particles,

fluidizing the bed,

turning the object so that a portion thereof is exposed from the bed in the selected alignment position and a portion thereof remains embedded, and

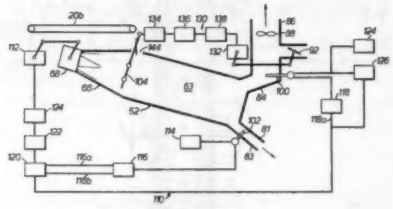
discontinuing the fluidizing so that the object is held in place by the defluidized particles.

4,249,890

PRODUCTION OF HEATED BITUMINOUS MIXES

Kenneth P. Graham, Surrey Hills, Australia, assignor to K. P. Graham & Associates Pty. Ltd., Surrey Hills, Australia

Filed Jun. 21, 1978, Ser. No. 917,705
Int. Cl.³ F27B *14/00*
U.S. Cl. 432—13 **16 Claims**



1. A method of producing a heated aggregate mix comprising the steps of:

feeding base products including an aggregate mix into a closed treatment chamber via a base products feed port;

maintaining a flow of gases through the chamber;

tumbling the base products in the chamber while heating them, by means of a burner disposed at one end of the treatment chamber, to a temperature sufficient to convert the base products to a heated mix of desired specification; and

retrieving the heated mix from the chamber via a heated mix retrieval port;

and further comprising the step of supplying air to the treatment chamber at a rate which is determined automatically in direct dependence upon the rate at which fuel is supplied to the burner, and wherein said flow of gases through the chamber is controlled automatically in direct dependence upon the gas pressure monitored in the treatment chamber in the vicinity of whichever of the base products feed port and the heated mix retrieval port is nearer the burner.

4,249,891

ADVANCED OPTIMUM CONTINUOUS CROSSFLOW GRAIN DRYING AND CONDITIONING METHOD AND APPARATUS

Ronald T. Noyes, and Eugene E. Williams, both of Frankfort, Ind., assignors to Beard Industries, Inc., Frankfort, Ind.

Filed Sep. 14, 1978, Ser. No. 942,447
Int. Cl.³ F27B *15/00*
U.S. Cl. 432—14 **15 Claims**

1. Grain drying and conditioning apparatus comprising:

a housing having an outer air impervious skin;

a pair of spaced air pervious walls, for confining a column of grain to be dried, mounted within said housing and forming a column of air between the outermost of said walls and said skin;

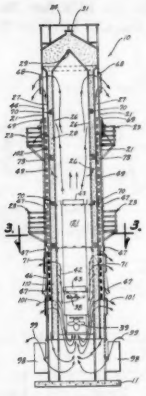
a plenum chamber formed between the innermost of said pervious walls;

blower and burner means having an inlet and an outlet, and

mounted within said plenum chamber and spaced inwardly from said innermost wall, including an air duct for controlling the direction of air expelled from the blower and burner means;

plenum divider means mounted within the space between the innermost of said walls and said blower and burner means in said plenum chamber for dividing said plenum chamber into first and second air flow sections;

means for selectively causing heated air to be forced through a first zone of said column of grain in one direction to heat and extract moisture therefrom and simultaneously causing air for cooling said grain to be pulled through a second zone of said grain column in an opposite direction to the flow of said heated air or causing heated air to be forced



through both said first and second zones thereby applying heated air to the entire column of grain; and

means operatively connected to said housing for selectively blocking the airflow in said air column between the skin and the outermost pervious wall and dividing said air column into first and second regions, said blocking means comprising a plate pivotally attached to said housing and means for pivoting said plate between a first position whereby said air column is blocked and a second position whereby said plate is moved to unblock the air column, said pivoting means further including means for moving said plate outwardly from said housing to a third position to cause an opening from said air column to atmosphere to allow air to enter or exhaust through said opening.

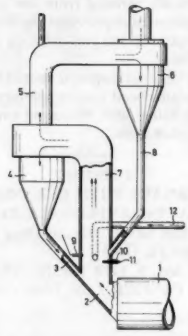
4,249,892

METHOD AND APPARATUS FOR THE THERMAL TREATMENT OF PULVERULENT MATERIAL PARTICULARLY FOR THE CALCINING OF CEMENT

Kunibert Brachthäuser, Bensberg; Hubert Ramesohl, Bensberg-Refrath, and Horst Herchenbach, Troisdorf, all of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Continuation of Ser. No. 752,910, Dec. 21, 1976, abandoned.
This application May 10, 1979, Ser. No. 37,731
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1975, 2558506
Int. Cl.[3] F27B *15/00*
U.S. Cl. 432—14 **4 Claims**

1. A method for the thermal treatment of pulverulent material in which said material is preheated and finely calcined in a final calcination zone, the improvement which comprises precalcining said pulverulent material in a highly turbulent gaseous stream containing combustible fuel in a pre-calcination zone prior to final calcination, the linear velocity of said gaseous stream upon contacting said pulverulent material being in the range of 25 to 40 meters per second and the turbulence of



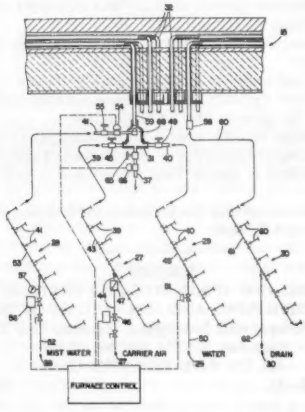
said gas stream extending at least as far as the portion of said pre-calcination zone in which said fuel is burned.

4,249,893

INTERNAL COOLING OF HEAT EXCHANGER TUBES

Richard R. Mayers, Delta; Steven R. Huebner, and Dennis A. Chojnacki, both of Toledo, all of Ohio, assignors to Midland-Ross Corporation, Cleveland, Ohio

Division of Ser. No. 969,116, Dec. 13, 1978, Pat. No. 4,211,088.
This application Dec. 21, 1979, Ser. No. 106,177
Int. Cl.[3] F27D *19/00*
U.S. Cl. 432—49 **11 Claims**



1. A method of injection of cooling media into a plurality of heat exchanger tubes in the base of a batch coil annealing furnace having an inner cover over the base to cool an environment external to the heat exchanger tubes and within the inner cover which comprises:

injecting air into each heat exchanger tube;

controlling the flow of air being injected;

injecting water mist into each heat exchanger tube;

controlling the flow of water mist being injected;

injecting water into each heat exchanger tube; and

controlling the flow of water being injected.

4,249,894

BLAST FURNACE FOR HEATING GRANULAR MATERIAL

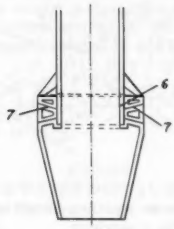
Bernhard Schulze-Heil, Wülfrath, Fed. Rep. of Germany, assignor to Rheinische Kalksteinwerke GmbH, Wülfrath, Fed. Rep. of Germany

Filed May 19, 1978, Ser. No. 907,535

Claims priority, application Fed. Rep. of Germany, May 20, 1977, 2722719

Int. Cl.³ F27D *1/08*; C21B *7/08*

U.S. Cl. 432—95 **5 Claims**



1. An improved lime-making vertical shaft-kiln for heating granular goods of the type including at least two similar interconnected furnace stacks, one of which heats the granular material by direct current while the discharge gases of the stack escape from the other unheated stack in a countercurrent movement, and wherein each of the stacks has a heating zone and a cooling zone and a hollow cylindrical member defining an annular channel disposed between the heating and cooling zones, the channels of each stack being connected to each other by cross-over canal means, the improvement comprising:

said stacks each having an enlarged, bosh-like shell wall joined to the lower end thereof having an upper cylindrical portion disposed laterally adjacent to and spaced from said hollow cylindrical member and a lower downwardly tapering frustoconical portion and means for suspending said shell walls from the lower end of the stack associated therewith which comprises a first set of support members, each of which has an upper end coupled to the lower end of said stack above said hollow cylindrical member and an opposite lower end connected to the upper end of said upper cylindrical portion of said shell wall as a result of which said support means is disposed above the frustoconical portion of the shell wall and is not exposed to the sloping heated material normally located in said lower frustoconical portions.

4,249,895

KILN

Enzo Mantegani, Milan, Italy, assignor to Welko Industriale S.p.A., Milan, Italy

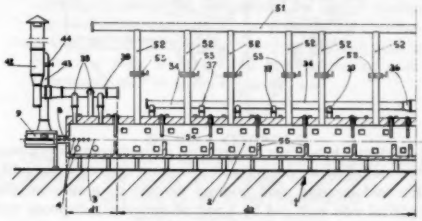
Filed Sep. 29, 1978, Ser. No. 947,176

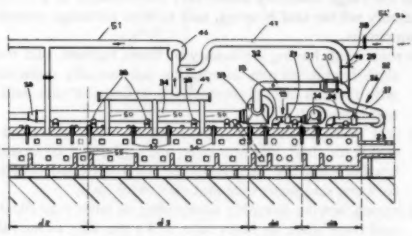
Claims priority, application Italy, Oct. 7, 1977, 28368 A/77; Jul. 10, 1978, 25488 A/78

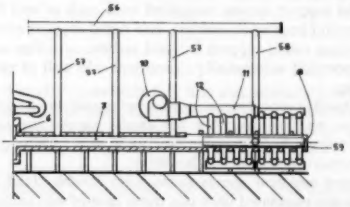
Int. Cl.³ F27B *9/02*

U.S. Cl. 432—128 **6 Claims**

1. A kiln for baking items progressively moving along the kiln, comprising a hollow elongated housing having an inlet and an outlet to receive and discharge the items to be treated, said housing including a preheating section, a baking section, a cooling section and a section for nature cooling, all successively located in said housing; means for introducing a cooling medium into said cooling section including a first blower and first regulating means connected to said first blower to control the amount of the cooling medium entering said cooling section, said introducing means being associated to a space in the cooling section immediately following said baking section to provide a substantial drop of the temperature of said items for accelerating the cooling process; means for withdrawing said medium as said medium is heated in heat exchange relationship with said items including first conduit means for receiving said withdrawn medium, second conduit means for receiving said withdrawn medium and ambient air from a supply source to be mixed with said medium to provide enriched combustion air, a second blower positioned between said first conduit means and said second conduit means and second regulating means connected to said second blower, said second regulating means being operatively connected to said first means to control the amount of medium to be withdrawn from said cooling section; means for connecting said second conduit means to said baking section for supplying the latter with enriched combustion air; third conduit means for receiving the gases from said section of natural cooling which gases are being heated in heat exchange







relationship with said items to be cooled; connecting conduit means located between said withdrawing means and said third conduit means; discharging means connected to said baking section to withdraw hot gases therefrom, said discharging means being associated with said third conduit means; and means for mixing said hot gases from said discharging means and heated gases from said third conduit means; and means for drawing the mixture to said pre-heating section;

separating means to separate said sections one from another for preventing undersired mutual influence in different treating regimes and

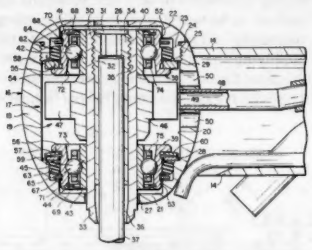
said separating means include sets of baffles mounted on an inner wall of said housing and located adjacent one to another so as to thermally separate each of two successive sections.

4,249,896

COMPLIANTLY MOUNTABLE TURBINE CARTRIDGE ASSEMBLY FOR GAS-DRIVEN DENTAL HANDPIECE

Frank W. Kerfoot, Jr., Newtown Square, Pa., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Sep. 29, 1978, Ser. No. 947,215
Int. Cl.³ A61C *1/05*
U.S. Cl. 433—132 **52 Claims**



1. A dental handpiece comprising a gas-driven motor, said motor including a housing and a turbine cartridge assembly within said housing, said housing defined by a substantially cylindrical side wall and by a pair of oppositely disposed end walls transverse to said side wall, said housing having turbine cartridge assembly support means located on portions of said walls for supporting said turbine cartridge assembly, said turbine cartridge assembly removably positionable as a unitary assembly within said housing, said turbine cartridge assembly comprising:

a rotor shaft having a plurality of vanes thereon, said rotor shaft having an axis of rotation substantially coincident with the axis of said substantially cylindrical side wall of said housing;

a first bearing assembly comprising an inner race fixed to said rotor shaft, an outer race, and a plurality of movable bearing elements frictionally engaged with and confined between said inner race and said outer race;

a second bearing assembly comprising an inner race fixed to said rotor shaft, an outer race, and a plurality of movable bearing elements frictionally engaged with and confined between said inner race and said outer race of said second bearing assembly;

radial support means associated with each of said first and second bearing assemblies, said radial support means providing radial support for said turbine cartridge assembly upon said substantially cylindrical side wall of said housing;

rigid axial support means connected to said outer race of said first bearing assembly for axially supporting said first bearing assembly outer race upon said turbine cartridge support means of said housing;

bearing pre-load means comprising flexible axial support means associated with said outer race of said second bearing assembly for yieldingly supporting said outer race upon said turbine cartridge support means of said housing;

first retaining means for retaining said radial support means upon said outer race of said first bearing assembly, said first retaining means preventing movement of said radial support means in an axial direction away from said rotor shaft vanes; and

second retaining means for retaining said radial support means and said flexible axial support means upon said outer race of said second bearing assembly, said second retaining means preventing movement of said radial support means and said flexible support means in an axial direction away from said rotor shaft vanes;

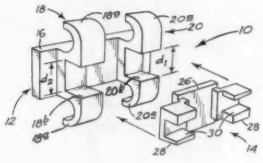
whereby said rigid axial support means and said flexible axial support means coact with turbine cartridge support means of said housing to provide axial pre-loading of said first and second bearing assemblies when said turbine cartridge assembly is operatively positioned within said housing.

4,249,897

MODULAR CUSHIONING ORTHODONTIC BRACKET STRUCTURE

Roland M. Anderson, 1616 SW. Sunset Blvd., Portland, Oreg. 97201

Filed Jan. 17, 1978, Ser. No. 870,204
Int. Cl.³ A61C *3/00*
U.S. Cl. 433—8 **4 Claims**



1. Orthodontic bracket structure for use with an orthodontic arch wire and the like comprising

a first bracket member of the twin edgewise type formed of a material having one preselected degree of elastic stiffness, and including ligation-anchoring means including a pair of laterally spaced post structures having a pair of confronting, generally upright faces which at least partially define a socket located adjacent said means, and

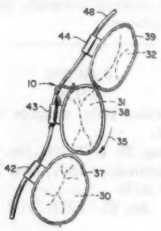
a second bracket member removably seatable in an omnidirectional fixed-captured manner within said socket and laterally against said faces, and formed of a material having another preselected degree of elastic stiffness which is less than said one preselected degree, said second member including means defining a void space adapted to receive a run of such an arch wire.

4,249,898

ORTHODONTIC ROTATION SPRING

Lawrence F. Andrews, La Jolla, Calif., assignor to "A"-Company, Inc., San Diego, Calif.

Filed Nov. 9, 1979, Ser. No. 92,871
Int. Cl.³ A61C *7/00*
U.S. Cl. 433—21 **6 Claims**



1. An orthodontic spring for exerting a rotational torque on a patient's tooth, the tooth being fitted with a tooth band to which is fastened an orthodontic bracket adapted to receive an archwire, said spring comprising:

a first generally planar spring segment having first and second ends;

means for attaching said first end of said first spring segment to said bracket;

a second generally planar spring segment extending at an angle from said second end of said first spring segment and

toward said tooth, said second spring segment having a curved outer end portion;

said first and second spring segments formed from a single length of spring material and having an outside surface generally facing said archwire and an inside surface opposite said outside surface;

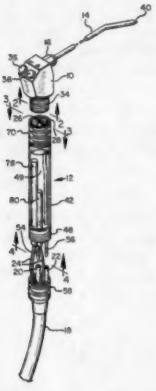
said outside surface at said second end of said first segment being biased against said archwire and said curved outer end portion of said second segment being biased against said tooth band, said outside surface having a recess to receive the archwire so that movement of said spring parallel to said outside surface is restricted, and said end portion being curved so that either said inside surface or said outside surface rests against said band, whereby said rotational torque is exerted on said tooth.

4,249,899

WARM WATER DENTAL SYRINGE

Eugene B. Davis, Newberg, Oreg., assignor to A-Dec, Inc., Newberg, Oreg.

Filed Feb. 14, 1979, Ser. No. 12,148
Int. Cl.³ A61G *17/02*
U.S. Cl. 433—32 **1 Claim**



1. A warm water dental syringe comprising:

a head having a water passage and an air passage therethrough;

a tip extending from the head and having a water passage therethrough communicating with the water passage through the head, and an air passage therethrough communicating with the air passage through the head;

an elongate tube adapted to be grasped as a handle and defining in its interior a water chamber, the tube having upper and lower ends;

a plug in each of said ends closing the same and defining with the inner wall of said tube said water chamber, each plug having water and air passages therethrough;

coupling means for releasably securing the upper end of the tube to the head so that the water passage through the upper end of the tube communicates with the water passage through the head and so that the air passage through the upper end of the tube communicates with the air passage through the head;

an air conduit mounted in the chamber and extending between and communicating with the air passages in said upper and lower plugs;

connecting means for attaching a water supply hose and an air supply hose at the lower end of the tube so that water can flow into the chamber through the water passage through the lower end of the tube and air can flow into the air conduit through the air passage through the lower end of the tube;

a first elongate cylindrical casing mounted within the water chamber and extending substantially the entire length thereof;

an electric heater element mounted in said first elongate cylindrical casing for heating the water in said chamber;

a second elongate cylindrical casing mounted within the water chamber and spaced from the first casing;

an electric thermostat mounted in said second elongate cylindrical casing for controlling the heater element to regulate the temperature of the water in the chamber;

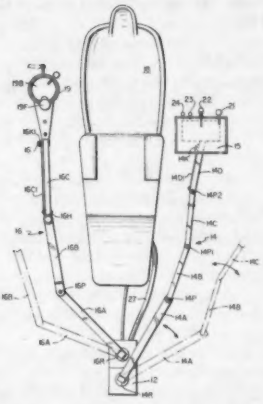
said first and second casings extending through said lower mounting plug whereby said heater element and said thermostat may be easily replaced.

4,249,900

DENTAL CONSOLE

E. Clyde Hoelzer, 2817 Maple La., Fairfax, Va. 22031, and Ellis Magnuson, 340 Ayrhill Ave., Vienna, Va. 22180

Filed Nov. 22, 1978, Ser. No. 962,943
Int. Cl.³ A61G *1/14, 15/00*
U.S. Cl. 433—79 **5 Claims**



1. A dental console including first and second support members adapted to be interchanged relative to each side of a dental chair permitting the console to be readily used by either a right-handed or left-handed individual comprising:

a first support member;

a substantially elongated first support arm for rotatably supporting said first support member, said first support arm being rotatably mounted adjacent to and outwardly displaced from a portion of a dental chair where a patient would would position his/her feet;

said substantially elongated first support arm including a plurality of links rotatably mounted relative to each other and an outermost link being mounted for rotatable and vertical adjustment for vertically adjusting said first support member;

said first support member including a work tray and a plurality of hand pieces mounted at an outermost end of said first support arm;

a second support member;

a substantially elongated second support arm for rotatably supporting said second support member, said second support arm being rotatably mounted adjacent to and outwardly displaced from said portion of said dental chair where a patient would position his/her feet;

said substantially elongated second support arm including a plurality of links rotatably mounted relative to each other and an outermost link being mounted for rotatable and vertical adjustment for vertically adjusting said first support member;

said second support member including a cuspidor and a second plurality of hand pieces mounted at an outermost end of said second support arm;

said substantially elongated first support arm being mounted on a common pedestal with said substantially elongated second support arm at a position above said second support arm, said second support arm being positioned to provide a gravity return for water supplied to said cuspidor;

said first and second support members being readily rotated to interchange the positioning of said first and second support members relative to each side of said dental chair, whereby said first support member may be positioned adjacent to one side of said dental chair and said second support member may be positioned adjacent to the other side of said dental chair while leaving an uncluttered area adjacent to a head portion of said dental chair.

4,249,901

TOOTH TREATMENT APPARATUS

Alfred Wieser, Bad Homburg, Fed. Rep. of Germany, assignor to Medtronic Gm'bH, Usingen, Fed. Rep. of Germany

Filed Oct. 19, 1978, Ser. No. 952,833

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1977, 2752437

Int. Cl.[3] **A61C** *1/07*

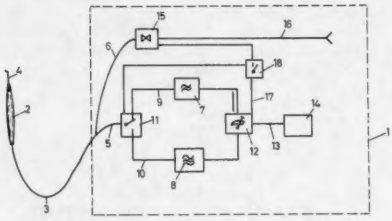
U.S. Cl. 433—119 **10 Claims**

1. Tooth treatment instrument comprising:

(a) a handle arrangement;

(b) vibratory transducer means in said handle arrangement for receiving said electrical signal and for generating an oscillatory mechanical output;

(c) first signal generator means for generating an ultrasonic electrical signal;



(d) second signal generating means for generating a high frequency electrical signal; and

(e) changeover means for selectively connecting the signal from the first or second generator means to the handle arrangement.

4,249,902

DYESTUFF FORMULATIONS

Winfried Kruckenberg, and Karl H. Schündehütte, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 30, 1978, Ser. No. 911,034

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1977, 2724951; Nov. 18, 1977, 2751598; Dec. 10, 1977, 2755167; Dec. 30, 1977, 2759102

Int. Cl.[3] C09B *1/00, 67/00*

U.S. Cl. 8—525 29 Claims

1. A homogeneous dyestuff formulation free of organic solvent obtained without fine comminution of the dyestuff to below a particle size of 50μ consisting essentially of an organophilic dyestuff free from ionic groups other than COOH and having a melting point of less than 140° C. admixed with an emulsifying polar/non-polar compound of the formula

$$A—(B)_n—(D)_m$$

in which

A is a non-polar radical with at least 8 consecutive carbon atoms;

B is a bridge member;

n is 0 to 5;

D is a hydrophilic group; and

m is 1 to 5.

4,249,903

PROCESS FOR THE PREPARATION OF ALUMINO-SILICATE GRANULATES

Heinz G. Smolka, Langenfeld, and Edgar Köppelmann, Hilden, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Jun. 27, 1979, Ser. No. 52,563

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1978, 2829165

Int. Cl.[3] B01J *39/14;* C01B *33/28;* C02F *1/42;* C11D *3/12*

U.S. Cl. 8—137 17 Claims

1. A process for the production of a cation-exchanging alkali metal aluminosilicate granulate having a particle size of from 0.05 to 1 mm consisting essentially of

(a) charging a finely-divided, crystalline, water-containing alkali metal aluminosilicate having the molar composition of

$$0.7\text{–}1.5M_2O.Al_2O_3.0.8\text{–}6SiO_2$$

wherein M represents a cation of an alkali metal, a particle size of less than 30μ and a calcium binding power of from 50 to 200 mg of CaO/gm of anhydrous aluminosilicate, into an area having means to mix a powder with a liquid,

(b) adding thereto while mixing, either simultaneously or consecutively,

(i) m mols of SiO_2 in a form selected from the group consisting of an aqueous solution of an alkali metal silicate having a molar ratio of 1 Na_2O:1 to 3.5 SiO_2, and an SiO_2 content of from about 10% to about 40% by weight, and an aqueous silicic acid sol having an SiO_2 content of from about 10% to about 40% by weight, and

(ii) n mols of Al_2O_3 in a form selected from the group consisting of acidic hydrolyzing aluminum salts, powdered alkali metal aluminate, aqueous solution of alkali metal aluminate and mixtures, where the total amount of added SiO_2 being from 5% to 30% by weight of the mixture of aluminosilicate powder and added SiO_2, and the ratio of m:n being about 1:1 to about 5:1,

(c) mixing for from 1 to 120 minutes until the moisture is uniformly adsorbed by the solids and a granulate having a particle size of from 0.05 to 1 mm is formed, and

(d) drying the granulate for 0.5 to 30 hours at a temperature of from 80° to 150° C.

11. The cation-exchanging alkali metal aluminosilicate granulate having a particle size of from 0.05 to 1 mm, a grain stability when tested according to the grain stability test of at least 40% over 0.1 mm and a calcium-complexing capacity when tested according to the calcium-complexing capacity test at 50° C. for 10 minutes of at least 40 mg CaO per gm of anhydrous aluminosilicate granulate, produced by the process of claim 1.

12. In the process for softening circulating wash liquor comprising passing a wash liquor containing wash-active substances from the wash area through a separate area containing a solid cation exchanger and back to the wash area, the improvement comprising utilizing the cation-exchanging alkali metal aluminosilicate granulate of claim 11, as said solid cation exchanger.

13. The process of claim 12 wherein said wash area contains textiles to be washed.

4,249,904

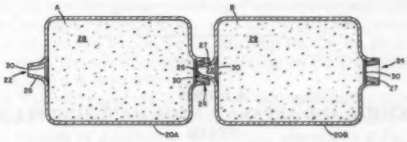
METHOD AND APPARATUS FOR EXTRACTION OF AIRBORNE N-NITROSO COMPOUNDS WITHOUT ARTIFACT FORMATION

David P. Rounbehler, Concord, and John W. Reisch, Brookline, both of Mass., assignors to Thermo Electron Corporation, Waltham, Mass.

Filed Jul. 27, 1979, Ser. No. 61,554

Int. Cl.[3] G01N *31/00, 27/62;* C01G *28/00*

U.S. Cl. 23—230 M 28 Claims



22. Method of extracting nitrosamine compounds from an air sample without forming nitrosamine artifacts from precursors in said sample, comprising the successive steps of:

A. passing said sample through a zone in a first cartridge and a zone in a second cartridge in succession, said zone of said first cartridge containing an air pervious packing of a first granular, solid-phase amine complexing agent and said zone of said second cartridge zone containing an air pervious packing of a mixture of a second granular, solid-phase amine complexing agent and a particulate sorbent adapted to extract and concentrate nitrosamine from air,

B. passing an eluent through said zone of said second cartridge and said zone of said first cartridge in succession, said eluent being a polar, or nitrogenous based, solvent for nitrosamines and said second amine complexing agent, or mixtures of such solvents.

4,249,905

TREATMENT OF CEMENT COPPER

Bruce F. Caswell, Whitmore Lake, Mich., assignor to Arcanum Corporation, Ann Arbor, Mich.

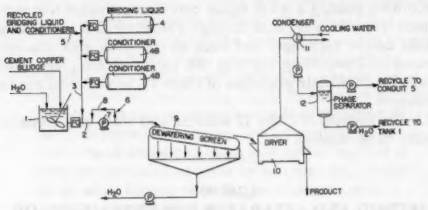
Filed May 18, 1978, Ser. No. 907,130

Int. Cl.[3] C22B *1/14*

U.S. Cl. 23—313 R 11 Claims

1. A process for dewatering an aqueous cement copper slurry and forming agglomerates of the cement copper, said aqueous cement copper slurry having been prepared by contacting an aqueous leaching liquid containing dissolved copper salts with iron whereby to precipitate copper, the cement copper particles in said slurry having a particle size of less than about 100 mesh, said cement copper particles containing from about 60 to 90% copper and the balance being impurities, which comprises the steps of: adding to said aqueous cement copper slurry (a) hydrophobic organic bridging liquid and (b)

liquid conditioner effective to displace water from the cement copper particles and to render the surfaces of the cement copper particles oleophilic whereby to form a two-phase liquid system wherein the cement copper particles are dispersed in and wetted by said bridging liquid and the other liquid phase is water essentially free of cement copper particles, agitating the two-phase liquid system to effect repeated collisions of said particles and thereby forming in said system a slurry of ag-



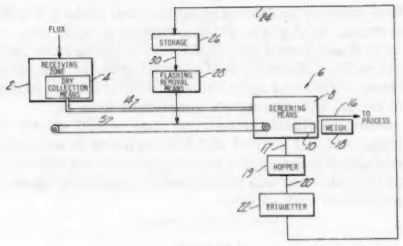
glomerates in the water phase wherein said agglomerates consist essentially of the solid cement copper particles having said conditioner adsorbed thereon and bound together by said hydrophobic organic bridging liquid, discontinuing said agitating, separating said agglomerates from the freely drainable water and then drying said agglomerates to remove therefrom substantially all of said hydrophobic organic bridging liquid, said liquid conditioner and the remainder of the water.

4,249,906

METHOD AND APPARATUS FOR HANDLING FLUX FINES

Phillip C. Howell, 28842 Swan Island Dr., Grosse Ile Township, Wayne County, Mich. 48138

Filed Dec. 17, 1979, Ser. No. 104,382
Int. Cl.[3] C21B *3/04;* **C22B** *7/02, 1/14;* **B01D** *50/00*
U.S. Cl. 23—313 R **9 Claims**



6. A method for handling limestone containing fines and delivering it to a metallurgical-process vessel, comprising

separating and collecting an airborne portion of said fines at a receiving station,

conveying the remainder of said limestone including a no-airborne-fines portion to a screening means via a belt conveyor,

screening said limestone to recover an oversize portion suitable for direct feeding to said vessel and an undersize portion,

briquetting said undersize portion in the absence of binder to form briquettes of minimum dimensions corresponding to that of said oversize portion, and

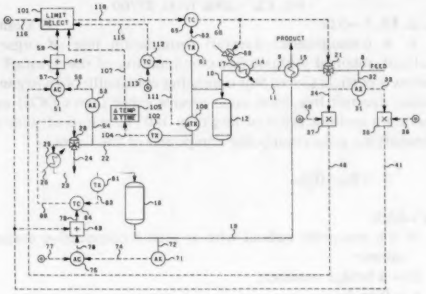
feeding said briquettes to said vessel before they have undergone substantial absorption of moisture and degradation.

4,249,907

TEMPERATURE CONTROL OF EXOTHERMIC REACTIONS

Ricardo J. Callejas, Maracaibo, Venezuela, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 23, 1979, Ser. No. 69,155
Int. Cl.[3] C07B *1/00*
U.S. Cl. 23—230 A **11 Claims**



6. A method for providing control of the primary control of the temperature of a selective hydrogenation process in which at least a portion of a first constituent in a feed stream is removed from said feed stream in a catalyst bed comprising the steps of:

establishing a first signal representative of the difference between the temperature of the reaction effluent flowing from said catalyst bed and the temperature of said feed stream;

responsive to said first signal, establishing a second signal representative of the temperature of said feed stream necessary to maintain a desired difference between the temperature of said reaction effluent and the temperature of said feed stream;

establishing a third signal representative of the rate of change of the temperature of said reaction effluent;

establishing a fourth signal representative of a limit on the rate of change of the temperature of said reaction effluent; and

overriding the primary control of said selective hydrogenation process to thereby manipulate the temperature of said feed stream in response to said second signal if the magnitude of said third signal is greater than the magnitude of said fourth signal.

4,249,908

TEMPERATURE CONTROL OF EXOTHERMIC REACTIONS

Gary L. Funk, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 11, 1979, Ser. No. 74,274
Int. Cl.[3] C07B *1/00*
U.S. Cl. 23—230 A **11 Claims**

7. A method for removing a first constituent in a feed stream, wherein said feed stream is supplied to the first of two reaction zones in series, comprising the steps of:

establishing a first signal representative of a prediction of the temperature of said feedstream required to maintain a desired concentration of said first constituent in the product stream flowing from the second one of said two reaction zones in series;

establishing a second signal representative of the actual concentration of said first constituent in said product stream;

establishing a third signal representative of the desired concentration of said first constituent in said product stream;

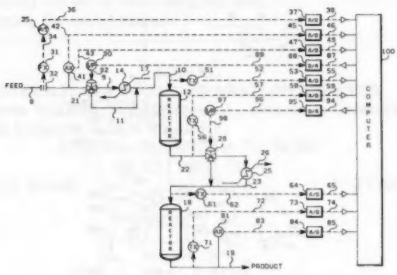
comparing said second signal and said third signal and estab-

lishing a fourth signal responsive to the difference between said second signal and said third signal;

biasing said first signal with said fourth signal to produce a fifth signal representative of a corrected prediction of the temperature of said feedstream required to maintain the desired concentration of said first constituent in said product stream;

manipulating the temperature of said feedstream in response to said fifth signal;

establishing a sixth signal representative of a prediction of the differential temperature across the second one of said two reaction zones in series required to maintain the ratio of the differential temperature across the second one of said two reaction zones in series to the differential temperature across the first one of said two reaction zones in series substantially equal to a desired ratio of the differential temperature across the second one of said two reaction zones in series to the differential temperature across the first one of said two reaction zones in series;



establishing a seventh signal representative of the temperature of the effluent stream flowing from the first one of said two reaction zones in series to the second one of said two reaction zones in series;

establishing an eighth signal representative of the temperature of said product stream;

comparing said seventh signal and said eighth signal and establishing a ninth signal responsive to the difference between said seventh signal and said eighth signal;

comparing said sixth signal to said ninth signal and establishing a tenth signal responsive to the difference between said sixth signal and said ninth signal; and

manipulating the temperature of said effluent stream in response to said tenth signal.

4,249,909

DRYING AND PASSIVATING WET COALS AND LIGNITE

Alfred G. Comolli, Yardley, Pa., assignor to Hydrocarbon Research, Inc., Lawrenceville, N.J.

Filed May 30, 1979, Ser. No. 43,857
Int. Cl.³ C10L *9/08;* F26B *3/00*
U.S. Cl. 44—1 G **10 Claims**

3. A process for continuously drying particulate solid carbonaceous material containing at least about 10 weight percent moisture, comprising the steps of:

(a) introducing the material into a first compartment maintained at about atmospheric pressure and heating it to at least about 150° F. to remove surface moisture at a drying rate for achieving initial surface drying:

(b) passing the partially dried material into a second compartment maintained at lower water vapor differential pressure to remove remaining bound moisture from the material at a slower drying rate so as to permit evolution of internal hydrocarbon material to self seal particle surface pores with said internal hydrocarbon material; and

(c) removing the dried carbonaceous material as product.

4. The process of claim 3 wherein the carbonaceous material is lignite containing 15–50 weight percent moisture.

4,249,910

PROCESS FOR REMOVING SULFUR FROM COAL

George P. Masologites, Columbus, N.C.; Jui-Yuan Sun, South Holland, Ill.; Jin S. Yoo, Flossmoor, Ill., and Emmett H. Burk, Jr., Glenwood, Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed Sep. 21, 1978, Ser. No. 944,452
Int. Cl.³ C10L *9/10, 5/14*
U.S. Cl. 44—1 SR **23 Claims**

1. A process for reducing the sulfur and ash content of coal comprising the steps of:

(1) contacting coal particles containing ash and iron pyrite mineral matter with a promoting amount of at least one conditioning agent capable of modifying or altering the existing surface characteristics of the pyrite under conditions to effectuate alteration or modification of at least a portion of the contained pyritic sulfur;

(2) agglomerating the coal particles while said pyrite surfaces are altered or modified in an aqueous medium with hydrocarbon oil;

(3) separating coal hydrocarbon oil agglomerates from at least a portion of the iron pyrite mineral matter and ash; and

(4) recovering coal hydrocarbon oil agglomerates wherein the coal exhibits reduced sulfur and ash content.

4. The process of claim 1 wherein the conditioning agent is selected from the group consisting of metal oxides and hydroxides having the formula $M_aO_b.\ xH_2O$ or $M(OH).xH_2$), wherein M is Al, Fe, Co, Ni, Zn, Ti, Cr, Mn, Mg, Pb, Ca, Ba, In or Sb; a, b and c are whole numbers depending on the ionic valence of M, and x is from 0 to about 3.

5. The process of claim 1 wherein the conditioning agent is selected from the group consisting of metal aluminates having the formula $M'_d(AlO_3)_3$ or $M'_f(AlO_2)_g$, wherein M is Fe, Co, Ca, Mg, Ba, Zn, Pb or Mo; and d, e, f and g are whole numbers depending on the ionic valence of M.

6. The process of claim 1 wherein the conditioning agent is selected from the group consisting of alumina-silicates having the formula $Al_2O_3.x\ SiO_2$ wherein x is from about 0.5 to 5.

4,249,911

COMBUSTIBLE FUEL COMPOSITION

Bernard L. Denker, Key Biscayne, Fla., and Franklin D. Hoffert, Mountainside, N.J., assignors to Hydrocarbon Research, Inc., Lawrenceville, N.J.

Filed Feb. 15, 1979, Ser. No. 12,428
Int. Cl.³ C10L *1/18*
U.S. Cl. 44—53 **11 Claims**

1. A fuel composition comprising a mixture of carbon black particles and a combustible liquid selected from the group consisting of alkyl alcohols having 1 to 4 carbon atoms, the carbon black being present in an amount of up to about twenty percent (20%) by weight of the composition.

4,249,912

AMINOAMIDE FUEL DETERGENTS

Hans D. Holtz, deceased, late of Bartlesville, Okla. (by Marilyn T. Holtz, executrix), and Benedict R. Bonazza, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 27, 1978, Ser. No. 900,553
Int. Cl.³ C10C *1/22;* C10M *1/40, 1/32*
U.S. Cl. 44—71 **5 Claims**

1. A method for reducing engine deposits in an internal combustion engine comprising the addition to the hydrocarbon fuel for the engine of a detergent fuel additive that is the reaction product of an aminoamide of the formula

$R''_2N[(CH_2)_aNR'']_bR''$

where a is 1 to 6, b is zero to 5, and R'' is CH_2CONHR' with R' a hydrocarbyl radical of about 8–100 carbon atoms and a sulfonic acid having the formula $R'''SO_3H$ where R''' is chosen from among an aryl and an alkaryl group with 6 to about 100 carbon atoms said ashless fuel detergent being added in an amount effective to reduce engine deposits and using said hydrocarbon fuel with ashless fuel detergent additive as fuel in an internal combustion engine.

4,249,913

ALUMINA COATED SILICON CARBIDE ABRASIVE

Gerard F. Johnson, Wilmington, N.C., and Peter W. Schilke, Scotia, N.Y., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 831,836, Sep. 9, 1977, abandoned. This application May 21, 1979, Ser. No. 41,230

Int. Cl.³ B24D *11/00*

U.S. Cl. 51—295 **10 Claims**

1. A high temperature particulate, useful as an improved dispersoid in a metal matrix, comprising silicon carbide particulates having a predominantly alumina coating, the coating being resistive to diffusion or dissolution in superalloys at temperatures of 2000° F. or more.

4,249,914

CUTTING TOOL MATERIAL AND METHOD FOR PRODUCING CUTTING TOOL MATERIAL

Kazuki Ogawa; Mitsuhiko Furukawa; Yoshimichi Hara, and Takashi Kitahira, all of Fukuoka, Japan, assignors to Nippon Tungsten Co., Ltd., Fukuoka, Japan

Filed Apr. 18, 1978, Ser. No. 897,467

Claims priority, application Japan, Apr. 20, 1977, 52-45345

Int. Cl.³ B24D *3/04*

U.S. Cl. 51—309 **4 Claims**

1. A method for producing a cutting tool material comprising:

(i) preparing a powder mixture of raw material powder consisting of 0.5 to 5 percent by weight of TiN and 99.5 to 95 percent by weight of Al_2O_3, said TiN and Al_2O_3 both having a grain size of less than 1 μm,

(ii) forming said powder mixture into a green compact by compressing said powder mixture,

(iii) presintering said green compacts in a vacuum at a maximum temperature of 1500° C. until a presintered body having a relative density of more than 95 percent is obtained, and

(iv) subjecting the presintered body to hot isosatic pressing for 30 to 60 minutes at 1400°–1450° C. under a gas pressure of 1300 to 2000 kg/cm^2.

2. Cutting tool material consisting of 0.5 to 5 percent by weight of Tin and 99.5 to 95 percent by weight of Al_2O_3, and having a maximum grain size of less than 2 μm and a hardness of more than H_RA 94 prepared by the process of claim 1.

4,249,915

REMOVAL OF WATER AND CARBON DIOXIDE FROM AIR

Shivaji Sircar, Allentown, and Wilbur C. Kratz, Macungie, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 30, 1979, Ser. No. 43,770

Int. Cl.³ B01D *53/04*

U.S. Cl. 55—26 **14 Claims**

1. The process of removing water and CO_2 from an air feed stream containing the same, which comprises the steps of:

introducing the air stream at superatmospheric pressure into a first bed of solid adsorbent effective in adsorption of water from said feed air stream,

discharging the dried air from the first bed and introducing a major portion thereof into an initial second bed containing adsorbent effective in retention of CO_2,

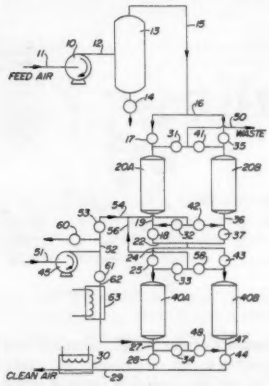
collecting the clean dry air thus obtained as product gas;

regenerating said first bed after a relatively short on-stream operating period and, during said regenerating of said first bed, introducing the air feed stream into a companion parallel bed of similar composition as said first bed and operated in alternating sequence therewith, the regeneration of said first bed being effected by the sequential steps of:

(a) reducing the pressure at the air feed inlet of the bed thus venting at least voids gas from the bed,

(b) purging the bed at the reduced pressure with a dry gas, and

(c) introducing dried air discharged from said companion bed into the purged bed to bring said bed to initial superatmospheric pressure for further adsorption of water;



said alternating introduction of feed air into said first bed and said companion bed being continued for a relatively long period while continuing to discharge dried air from said first bed and said companion bed each in turn to said initial second bed;

independently regenerating said initial second bed after said relatively long on-stream period by the sequential steps of

(d) depressurizing the CO_2-laden bed by venting therefrom a gas effluent including voids gas,

(e) elevating the temperature of the bed to drive off adsorbed CO_2,

(f) introducing cool gas into the bed to restore the same to near ambient temperature, and

(g) bringing the cooled bed to its initial adsorption pressure level by introduction of dry CO_2-free product gas.

4,249,916

ABSORBER TOWER ISOLATION SYSTEM

David C. Dick, Richardson, and James M. Hurt, Jr., Duncanville, both of Tex., assignors to Texas Utilities Services, Inc., Dallas, Tex.

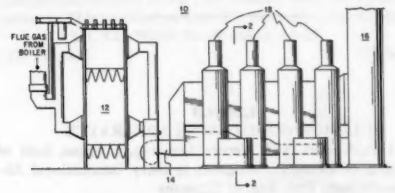
Division of Ser. No. 13,188, Feb. 16, 1979. This application Jul. 30, 1979, Ser. No. 61,692

Int. Cl.³ B01D *15/00*

U.S. Cl. 55—73 **4 Claims**

1. In a flue gas desulphurization system used in a steam electric generating plant having a steam generator, a flue gas duct for conveying flue gas from the steam generator, at least one absorber tower for receiving, desulphurizing and returning the flue gas via lower inlet and upper outlet ducts between the flue gas duct and each absorber tower, dampers within the inlet and outlet ducts for regulating the flow of the flue gas, inlet and outlet blank-off plates for sealing the respective duct connections at the flue gas duct and discharging it to the atmosphere, a method for starting up an absorber tower that has been isolated for maintenance purposes comprising:

sealing the inlet and outlet ducts from the atmosphere;
equalizing the pressures in the main flue and inlet duct;
opening the inlet blank-off plate;



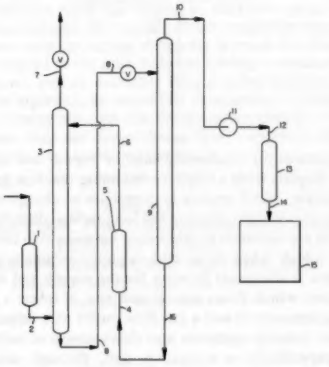
opening the inlet damper;
opening the outlet blank-off plate; and,
opening the outlet damper.

4,249,917

STERILIZATION GAS SEPARATION PROCESS

Gregorio Tarancon, Woodbridge, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Nov. 21, 1979, Ser. No. 96,406
Int. Cl.³ B01D *53/14*
U.S. Cl. 55—48 **3 Claims**



1. A process for the separation of a second mixture consisting essentially of ethylene oxide and dichlorodifluoromethane from a first mixture comprising ethylene oxide, dichlorodifluoromethane, and air comprising passing the first mixture through two zones connected in series, in a closed system, according to the following steps:

(a) passing the first mixture, in gaseous form, into an absorption zone and contacting said first mixture therein counter-currently with an organic liquid solvent, which has a boiling point of at least 120° C. and is capable of absorbing ethylene oxide and dichlorodifluoromethane under process conditions, at a pressure of about 80 psia to about 450 psia and a temperature of about minus 12° C. to about 24° C., the solvent being present in sufficient amount to absorb essentially all of the ethylene oxide and dichlorodifluoromethane whereby liquid bottoms are formed, and the air, in gaseous form, passes overhead;

(b) passing the bottoms from step (a) into a desorption zone wherein the pressure is in the range of about 5 psia to about 25 psia, and the temperature is in the range of about minus 12° C. to about 24° C. at the top of the zone and in the range of about 40° C. to about 120° C. at the bottom of the zone with a temperature gradient in between, in such a manner that the ethylene oxide and dichlorodifluoromethane are vaporized forming a gaseous overhead and the solvent forms liquid bottoms; and

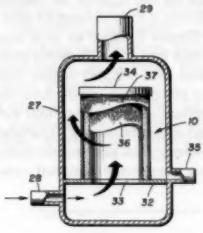
(c) recovering the overhead from step (b).

4,249,918

FIBER BED ELEMENT AND PROCESS FOR REMOVING AEROSOLS FROM GASES

Wesley B. Argo, Town and Country; Babur M. Kocatas, Clayton, and S. A. Ziebold, Mehlville, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed May 21, 1979, Ser. No. 41,120
Int. Cl.³ B01D *46/02*
U.S. Cl. 55—97 **10 Claims**



1. A fiber bed element for removing aerosols from a moving stream of gas, comprising a bed of fibers having a substantial portion of the voidage between the fibers of the fiber bed extending, with substantial continuity, in a generally vertical direction and a collecting layer wherein said fibers within said bed of fibers, hereinafter referred to a said drainage layer, have a mean diameter of 15–75 microns, said drainage layer being positioned in contact with said collecting layer, said collecting layer having randomly-oriented fibers having a mean diameter of 2–15 microns and being packed to a density greater than the packing density of the fibers in said drainage layer.

8. A method of removing aerosols from a gas, comprising:

a. providing a fiber bed element comprising a bed of fibers having a substantial portion of the voidage between the fibers of the fiber bed extending, with substantial continuity, in a generally vertical direction,

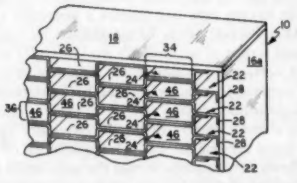
b. passing the gas through the element substantially normal thereto at a predetermined velocity.

4,249,919

MATRIX TYPE ELECTROSTATIC PRECIPITATOR

Charles G. Kalt, 29 Hawthorne Rd., Williamstown, Mass. 01267

Filed Dec. 26, 1978, Ser. No. 972,985
Int. Cl.³ B03C *3/36, 3/45, 3/64*
U.S. Cl. 55—130 **5 Claims**



1. An air cleaner comprising:

(a) a plurality of first electrically conductive filter elements configured generally in planes, and positioned in a flowing air current in a position where the intersection of each of said first filter elements and a plane perpendicular to the direction of flow of the air current has an area which is

very much smaller than the total surface area of each of the first filter elements;

(b) a plurality of second electrically conductive filter elements configured generally in planes, and positioned in a flowing air current in a position where the intersection of each of said second filter elements and a plane perpendicular to the direction of flow of the air current has an area which is very much smaller than the total surface area of each of the second filter elements;

(c) support means for supporting said first and second electrically conductive filter elements in positions where at least a portion of each of said first filter elements is in facing spaced relationship to a portion of one of said second filter elements, said first and second filter elements defining passages for the flow of air therebetween; and

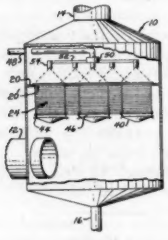
(d) means for applying a first voltage to said first filter elements and a different voltage to said second filter elements; wherein said first filter elements have a corrugated configuration, and said support means comprises means bonding said first electrically conductive filter elements to said second electrically conductive filter elements to form said elements into a matrix having input and output faces, the mechanical strength of said matrix being increased by a non-conductive supportive material coated on one of said faces.

4,249,920

SCRUBBER AND METHOD UTILIZING WETTED SLOTTED SCREENS FOR REMOVING FLYASH FROM FLUE GAS

Lawrence M. Vesel, Conroe, Tex., assignor to UOP Inc., Des Plaines, Ill.

Filed Nov. 13, 1979, Ser. No. 93,462
Int. Cl.³ B01D *47/06*
U.S. Cl. 55—233 **9 Claims**



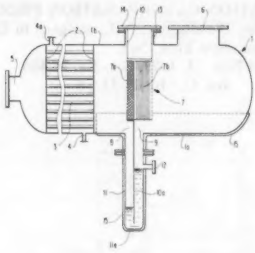
1. In a scrubber for removing flyash or other particulate matter from a stream of gas, the improvement comprising a chamber having a particulate containing gas inlet in the area of its bottom and an outlet for clean gas near its top, a mounting plate mounted generally horizontally in said chamber; said mounting plate having a plurality of apertures therein, each of said apertures having mounted therein a generally cylindrical canister having its side walls being defined by circumferentially arranged wraps of wire which are integrally attached to a plurality of vertically positioned rod members so as to define a series of vertically arranged, generally horizontal slots; a spray nozzle positioned axially relative to each of said canisters for directing a spray pattern of liquid outwardly against said wires, said liquid serving to wet substantially all of said wire wraps as it flows downwardly so that the substantial portion of the particulate matter in the gas passing over them will be captured in the liquid and will be washed down the wire walls of the canisters, said canisters being spaced so that substantially all of the upwardly flowing gases will have to pass into the vertical space betweem them and then change direction to enter and leave the slots in said canisters, thereby reducing the velocity of the particulate matter and increasing the efficiency of its collection, said gases also passing through said spray while moving upwardly through said canisters.

4,249,921

SULPHUR CONDENSING APPARATUS

Rainer Lell, Kerpen, and Werner Lemberg, Cologne, both of Fed. Rep. of Germany, assignors to Davy International Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 20, 1978, Ser. No. 971,304
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1977, 2756992
Int. Cl.³ B01D *50/00*
U.S. Cl. 55—269 **5 Claims**



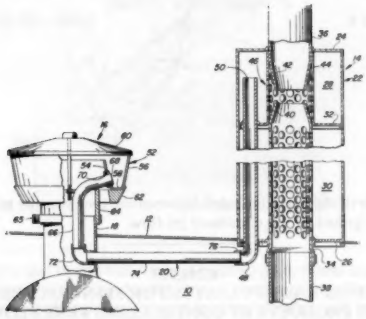
1. Apparatus for condensing sulphur vapour and separating sulphur droplets from a sulphur-containing reaction gas from a Claus reactor, which apparatus comprises an elongated vessel; a nest of tubes which extend in the longitudinal direction of the vessel and are arranged in said vessel between two tube plates, through which tubes flows said sulphur-containing gas; pipe connection at the vessel housing for the supply and discharge of a coolant which flows around said nest of tubes; a gas flow inlet pipe connection and a gas flow outlet pipe connection at the vessel housing upstream and downstream of said nest of tubes, respectively; a separation unit, through said gas is forced, adapted to separate sulphur droplets from said gas and arranged in said vessel between the tube plates at the downstream ends of the tubes and said gas flow outlet pipe connection; the separation unit occupies a part of the vessel cross section perpendicular to the direction of the gas flow and the remaining part of the vessel cross section is closed off to gas flow by a gas-tight partition; a first discharge opening arranged at the bottom of said vessel upstream of said separation unit for discharging sulphur separated from said gas before said unit, and a second discharge opening at the bottom of said vessel downstream of said separation unit for discharging sulfur separated from said gas in and behind the separation unit; and the upstream and downstream discharge openings both open into a pipe connection which is divided by an extension of said partition and which is closed at the bottom, said closed pipe connection having a sulphur overflow opening downstream of said partition, the partition extension ending in spaced relationship above the bottom of said closed pipe connection, said sulphur overflow opening being arranged at such a height above the bottom edge of said partition extension that the hydrostatic pressure of the liquid sulphur which collects in said closed pipe connection, corresponding to said height, is at least equal to the maximum gas pressure drop across the separation unit.

4,249,922

EXTRACTOR TUBE ARRANGEMENT FOR INTERNAL COMBUSTION ENGINE AIR CLEANER SYSTEM

Arvid H. Saele, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Continuation-in-part of Ser. No. 21,057, Mar. 16, 1979, abandoned. This application Feb. 25, 1980, Ser. No. 124,431
Int. Cl.[3] B01D *50/00*; B60K *13/02*
U.S. Cl. 55—315 3 Claims



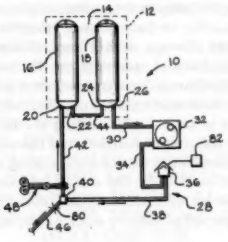
1. In combination with an engine compartment defined in part by a hood, an air cleaning system including an air cleaner located beneath the hood and having an inlet duct projecting upwardly therethrough, an engine exhaust conduit incorporating an aspirator and projecting upwardly through the hood, a precleaner coupled to the inlet duct and having a contaminant collecting bowl, and an extractor tube coupled between the bowl and the aspirator, an improved arrangement of the extractor tube comprising: said tube being located entirely within the precleaner, duct and compartment from a location closely adjacent the exhaust conduit to the bowl.

4,249,923

CARDIOPLEGIC FLUID REFRIGERATION AND DELIVERY SYSTEM

Kim L. Walda, 1468 Rosewood, Ann Arbor, Mich. 48104

Filed Jul. 10, 1979, Ser. No. 56,408
Int. Cl.[3] F67D *5/62*
U.S. Cl. 62—394 18 Claims



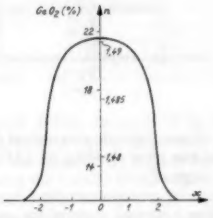
1. Apparatus for chilling and dispensing fluid stored in a receptacle unit having an inlet and an outlet and maintaining the fluid at a temperature of a predetermined value, said apparatus comprising a cabinet having an internal chilling compartment, chilling means disposed in said chilling compartment and having a heat transfer surface for absorbing ambient heat, said heat transfer surface and the outer surface of said receptacle unit corresponding at least partially in shape so that said receptacle unit can be disposed in said chilling compartment with said outer surface in direct engagement with said heat transfer surface to enable conduction of heat from said fluid to said chilling means, and dispensing means for discharging chilled fluid from said receptacle unit at a location outside of said chilling compartment, said dispensing means comprising a fluid passageway loop connected to said inlet and said outlet, a portion of said passageway loop being located outside of said chilling compartment, means for circulating said fluid from said outlet through said passageway loop and back to said receptacle unit through said inlet so that said portion of the passageway loop outside of said chilling compartment contains fluid having a temperature value substantially equal to said predetermined valve, and discharge means connected to said portion of said passageway loop selectively operable to discharge chilled fluid from said passageway loop.

4,249,924

PROCESS FOR THE PRODUCTION OF GRADED INDEX OPTICAL FIBRES

Arnaud de Panafieu; Christiane Baylac; Yves Nemaud; Marc Turpin, and Michel Faure, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed May 29, 1979, Ser. No. 42,785
Claims priority, application France, May 30, 1978, 78 16035
Int. Cl.[3] C03B *37/00*; C03C *15/00*; C03B *32/00*
U.S. Cl. 65—2 19 Claims



1. A process for the production of optical fibres consisting of a core with a graded refractive index and an optical cladding, comprising the preliminary formation of a blank having a unitary structure of a core with a graded refractive index with an optical cladding and larger in diameter than the fibre, comprising:

a first stage consisting in preparing a bath of molten glass from starting materials capable of entering into a glass composition showing the phenomenon of separation into two solid interconnected and continuous phases of different composition; said starting materials having an impurity content of less than 10^{-4}, calculated taking into account molar proportions of oxides of transition metals; wherein the starting materials comprise, in predetermined proportions, base materials comprising at least oxides of silicon, boron, sodium and doping agents comprising at least one oxide selected from the group of germanium, titanium, phosphorous and aluminum oxides;

a second stage comprising a first step of drawing a blank from the glass bath and a second step comprising at least one thermal annealing treatment which results in the appearance of the two solid interconnected and continuous phases of different composition, namely a hard phase rich in silica and a soft phase poor in silica, the soft phase having collected most of the impurities of the initial bath;

a third stage comprising the following steps:

(a) deep leaching of the blank to eliminate the soft phase and the impurities which it contains, leaving the doping agent emanating from the soft phase as leaching residue to an extent which increases from the periphery to the core of the blank;

(b) surface leaching to reduce the concentration of doping agent at the periphery of the blank, thereby forming a unitary optical cladding;

a fourth stage comprising a heat treatment in a controlled atmosphere for consolidating the blank.

4,249,925

METHOD OF MANUFACTURING AN OPTICAL FIBER

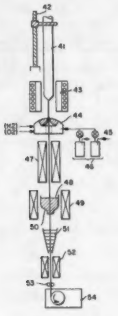
Masao Kawashima, Yokohama; Hisanao Okada, and Bun Kikuchi, both of Oyama, all of Japan, assignors to Fujitsu Limited, Tokyo, Japan

Filed May 4, 1979, Ser. No. 35,843

Claims priority, application Japan, May 12, 1978, 53-56334; May 12, 1978, 53-56335

Int. Cl.³ C03C *25/02*

U.S. Cl. 65—3 A **10 Claims**



1. A method of manufacturing an optical fiber comprising a core and at least one glass cladding on said core, said method comprising the steps of:

manufacturing said core to comprise a bare fiber by heating and extending a starting material for said core,

coating a starting material for said at least one glass cladding in the form of fine granules of oxide onto said core, and

forming said at least one glass cladding by heating said fine granule oxide coating.

4,249,926

METHOD FOR JET ATTENUATION OF FIBERS WITH LOCALIZED COMBUSTION

Marcel Levecque, deceased, late of Birchrunville, Pa.; by Marc Levecque, administrator, Paris, France; Jean A. Battigelli, and Dominique Plantard, both of Rantigny, France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

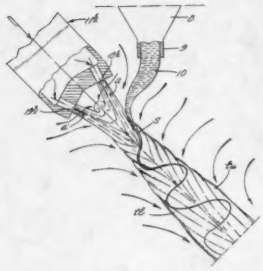
Continuation-in-part of Ser. No. 873,734, Jan. 30, 1978, abandoned, which is a division of Ser. No. 829,515, Aug. 31, 1977, Pat. No. 4,113,456, and a continuation-in-part of Ser. No. 780,589, Jan. 24, 1977, Pat. No. 4,070,173, and Ser. No. 762,789, Jan. 25, 1977, Pat. No. 4,102,662, and Ser. No. 676,755, Apr. 14, 1976, Pat. No. 4,118,213, each is a continuation-in-part of Ser. No. 557,282, Mar. 11, 1975, Pat. No. 4,015,964, which is a continuation-in-part of Ser. No. 353,984, Apr. 24, 1973, Pat. No. 3,885,940. This application Aug. 16, 1979, Ser. No. 66,938

Claims priority, application European Pat. Off., Aug. 16, 1979, 78400093

Int. Cl.³ C03D *37/06*; D01D *5/08*

U.S. Cl. 65—5 **12 Claims**

1. A method for manufacturing fibers from attenuable material, such as a thermoplastic material, by attenuation by means of gaseous currents, characterized in that at least one pair of gaseous jets is developed, said jets having substantially equal kinetic energy per unit of volume, and whose axes are disposed in substantially the same plane, the two jets inducing ambient gas and converging in a zone so as to provoke mutual impact and lateral broadening of the flow formed by the two combined jets, the jets comprising fuel and comburent components in proportions providing a combustible mixture in the combined jet flow, and characterized in that a stream of material is delivered into said zone, at a temperature at least as high as the ignition temperature of said mixture, from a point located



outside of the angle included between the two jets, the mixture being ignited in the combined jet flow.

4,249,927

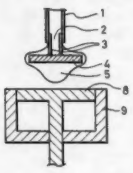
METHOD AND APPARATUS FOR MANUFACTURING GLASS PRODUCTS BY CONTROLLING FREE FLOW OF LOW VISCOSITY MOLTEN GLASS

Fukushichi Fukuzaki, Machida; Yoshio Ishii, Sagamihara, and Masaki Fukuzawa, Yokohama, all of Japan, assignors to Kabushiki Kaisha Ohara Kogaku Garasu Seizosho, Kanagawa, Japan

Filed Aug. 1, 1979, Ser. No. 62,879

Int. Cl.³ C03B *7/12*

U.S. Cl. 65—75 **4 Claims**



1. A method for manufacturing glass products by controlling free flow of low viscosity molten glass which comprises, bringing the low viscosity molten glass continuously fed out of a feeder outlet into contact with a control member provided below said feeder outlet, pouring the flowing glass into a mould provided below said control member, said flowing glass keeping contact with said control member while said flowing glass is received in said mould, cutting the flowing glass in a position below said control member and thereafter causing the glass to flow down to the mould after storing and holding the glass which continues to be fed out of said feeder outlet in a region under the lower surface of said control member for a predetermined period of time by utilizing the surface tension of the glass.

2. In an apparatus for manufacturing glass products including a feeder pipe for continuously feeding low viscosity molten glass, cutting means for cutting the glass fed out of said feeder pipe and a plurality of moulds which are displaced one by one to a region below said feeder pipe to receive the glass cut off by said cutting means, the improvement which comprises a control member provided below an outlet of said feeder pipe and above one of said moulds disposed below said feeder pipe, said cutting means being provided below said control member, said flowing glass keeping contact with said control member while said flowing glass is received in said mould and said control member storing and holding the glass fed out of said feeder in a region under the lower surface of said control

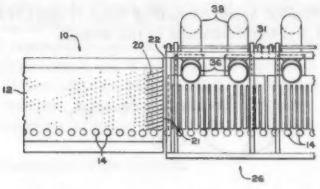
member for a predetermined period of time after cutting of the glass.

4,249,928

GAS HEARTH BED WITH GROOVED EXIT PORTION

G. Robert Carleton, Carlisle, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 4, 1979, Ser. No. 72,701
Int. Cl.³ C03B 27/00
U.S. Cl. 65—182.2 **5 Claims**



1. In a gas hearth bed for heat-treating glass sheets comprising a plenum chamber having an apertured roof provided with interior supply passages having openings through said roof for supplying gas under pressure from said plenum chamber to the upper surface of said roof to heat a glass sheet supported in closely spaced relation thereover and a plurality of interior exhaust passages having openings interspersed among said openings for said supply passages for removing sufficient gas to control the pressure of the gas that supports said glass sheet throughout the extent of said bed except for its downstream end portion,

said roof including additional smaller diameter interor supply passages in the downstream end portion of said gas hearth bed, and means for conveying a glass sheet supported by said pressurized gas along a given path over the length of said bed,

the improvement comprising a plurality of elongated grooves in the surface of said bed in the downstream end portion of said bed, said grooves having a gradually increasing depth an increasing distance away from the location of said openings of said interior exhaust passages.

4,249,929

METHOD OF DIGESTING ORGANIC WASTES

Franz Kneer, Am Honigbaum 6, D-6345 Eschenburg-Eibelshausen, Fed. Rep. of Germany

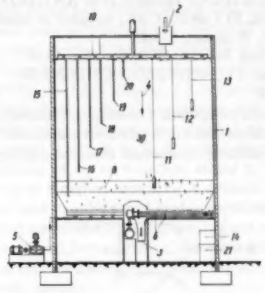
Continuation of Ser. No. 791,949, Apr. 28, 1977, abandoned, which is a continuation-in-part of Ser. No. 705,519, Jul. 15, 1976, abandoned, which is a continuation of Ser. No. 579,880, May 22, 1975, abandoned, which is a continuation of Ser. No. 409,718, Oct. 25, 1973, abandoned, and a continuation-in-part of Ser. No. 544,041, Jan. 27, 1975, abandoned, which is a continuation of Ser. No. 354,174, Apr. 25, 1973, abandoned. This application Nov. 1, 1978, Ser. No. 956,784

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1972, 2252188; Oct. 28, 1972, 2253009; Apr. 14, 1973, 2318978
Int. Cl.³ C02F 11/16
U.S. Cl. 71—9 **14 Claims**

1. A method for biologically digesting concentrated sewage sludge containing a plurality of anaerobic micro-organism species into compost, which comprises:

(a) introducing aerobic micro-organisms by admixing the sludge with a sufficient amount of a particulate organic carbon-containing material containing predominantly aerobic micro-organisms;

(b) introducing the mixture thus obtained into an aerating reactor having a top inlet and a bottom discharge so as to form an air-permeable material column in said reactor, while blowing air through the material column in an upward direction of the column, said blowing being effected in such quantities that due to the different oxygen consumption and metabolism of the different micro-organism species, the latter settle at distinct levels within the reactor space to form a plurality of distinct zones of different temperature and different oxygen content at different levels of said reactor which zones remain substantially stationary and at equilibrium so that both aerobic and anaerobic digestion take place while the method is carried out, the zone of the highest temperature being located in the uppermost third of the reactor space while the zone of the lowest temperature is located adjacent the bottom of the reactor, the temperature of said zone of highest temperature being sufficiently high so as to destroy pathogenic germs, the zone of the lowest oxygen content being located in the uppermost portion of the reactor while the zone of the highest oxygen content is located adjacent the bottom of the reactor;



(c) permitting the mixture to digest until it has formed compost in the lowermost portion of the reactor space;

(d) withdrawing said compost through said bottom outlet and adding fresh mixture through said top inlet to make up for said withdrawn compost, to form a continuously descending column of said mixture in said reactor which, during its descent, passes through said zones while air passes countercurrently through the column and the spent air is removed from the top of the reactor.

4,249,930

IONIC COMPOUNDS FORMED FROM IRON AND UREA

A. David Atkisson, Neosho, Mo., assignor to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed Mar. 8, 1979, Ser. No. 18,519
Int. Cl.³ C05C 9/00
U.S. Cl. 71—28 **20 Claims**

1. As a new compound for correcting iron deficiency in plants aquocarbamide iron II sulfate, corresponding to the formula

$$[Fe\{CO(NH_2)_2\}_n(H_2O)_{6-n}]^{++}SO_4^{--}$$

where n is 2, 3, 4 or 5,

said compound comprising dumbbell shaped crystalline particles.

4,249,931

5-OXY OR THIOMETHYL SUBSTITUTED OXAZOLIDINE HERBICIDE ANTIDOTES

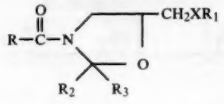
Eugene G. Teach, El Cerrito, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jun. 18, 1979, Ser. No. 49,697

Int. Cl.[3] A01N *25/32*; C07D *263/06*

U.S. Cl. 71—88 **109 Claims**

37. A herbicidal composition consisting essentially of a thiolcarbamate herbicide and a non-phytotoxic antidotally effective amount of an antidote compound therefor corresponding to the formula



wherein X is oxygen or sulfur and R_1 is alkyl containing from 1 to 6 carbon atoms, inclusive; R is selected from the group consisting of haloalkyl containing from 1 to 4 carbon atoms, inclusive, and the term halo includes chloro and bromo and alkoxycarboalkyl containing 3 to 6 carbon atoms, inclusive; R_2 is selected from the group consisting of phenyl, p-chlorophenyl and p-bromophenyl; and R_3 is selected from the group consisting of hydrogen and methyl.

4,249,932

5-PHENOXYMETHYL SUBSTITUTED OXAZOLIDINE HERBICIDE ANTIDOTES

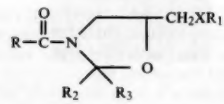
Eugene G. Teach, El Cerrito, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jun. 18, 1979, Ser. No. 49,814

Int. Cl.[3] A01N *25/32*; C07D *263/06*

U.S. Cl. 71—88 **25 Claims**

9. A herbicidal composition consisting essentially of a thiolcarbamate herbicide and a non-phytotoxic antidotally effective amount of an antidote compound therefor corresponding to the formula



wherein XR_1 is phenoxy, R is selected from the group consisting of haloalkyl containing from 1 to 5 carbon atoms, inclusive, where halo is chloro or bromo, and p-methyl phenylsulfonylamido; and R_2 and R_3 are independently selected from lower alkyl containing from 1 to 3 carbon atoms, inclusive.

4,249,933

HERBICIDAL AGENTS CONTAINING A THIOLCARBAMATE

Hanspeter Hansen, Ludwigshafen; Karl Eicken, Wachenheim, and Bruno Wuerzer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

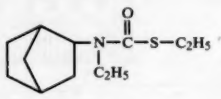
Filed Jul. 17, 1979, Ser. No. 58,259

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1978, 2832974

Int. Cl.[3] A01N *25/32*

U.S. Cl. 71—88 **7 Claims**

1. A herbicidal agent containing ethyl-N-ethyl-N-bicyclo-[2.2.1]-hept-2-yl-thiolcarbamate of the formula



as herbicidal active ingredient and an effective amount of at least one haloacylamide antagonistic agent selected from the group consisting of N-isopropyl-N-propargyldichloroacetamide, N-dichloroacetyl-4,4-dimethyltetrahydro-1,3-oxazine, N-dichloroacetyl-4,4,6-trimethyltetrahydro-1,3-oxazine, and N,N-diallyldichloroacetamide.

4,249,934

1,2-ALKYLENE-4-SUBSTITUTED URAZOLE HERBICIDES

Osamu Wakabayashi, Kawasaki; Kuni Matsuya, Yokohama; Hiroki Ohta, Machida; Tetsuo Jikihara, and Seiichi Suzuki, both of Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries, Limited, Tokyo, Japan

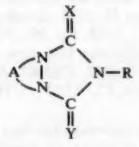
Continuation-in-part of Ser. No. 727,986, Sep. 29, 1976, abandoned, and a continuation-in-part of Ser. No. 681,454, Apr. 29, 1976, abandoned, said Ser. No. 727,986, and Ser. No. 681,454, is a continuation-in-part of Ser. No. 586,276, Jun. 12, 1975, abandoned. This application Sep. 19, 1978, Ser. No. 943,810

Claims priority, application Japan, Jun. 19, 1974, 49-70049; Sep. 11, 1974, 49-104608; Sep. 13, 1974, 49-105569; Sep. 18, 1974, 49-107341; Oct. 4, 1974, 49-114516; Nov. 18, 1974, 49-132492; Dec. 19, 1974, 49-146160; Dec. 27, 1974, 49-603; Jan. 20, 1975, 50-8544

Int. Cl.[3] A01N *43/64*; C07D *487/04*

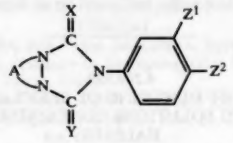
U.S. Cl. 71—92 **29 Claims**

1. 1,2-Alkylene-4-substituted urazole derivatives represented by the formula



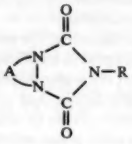
wherein A represents alkylene or alkenylene containing 3–6 carbon atoms, and wherein the adjacent nitrogen atoms of the urazole radical are bonded to different carbons of the A group, X and Y represent oxygen of sulfur respectively, but when A is alkenylene both X and Y are sulfur, R represents phenyl substituted in the 3- or 4- position with one or two substituents selected from halogen, lower alkyl, lower alkoxy, nitro halogenated benzyloxy or trihalomethyl.

2. 1,2-Alkylene-4-substituted urazole compounds represented by formula

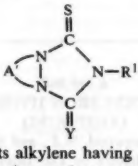


wherein A represents alkylene or alkenylene containing 3–6 carbon atoms, and wherein the adjacent nitrogen atoms of the urazole radical are bonded to different carbons of the A group, X and Y represent oxygen or sulfur, respectively, but when A is alkenylene both X and Y are sulfur, Z^1 represents hydrogen, halogen, lower alkyl or trihalomethyl, and Z^2 represents hydrogen, halogen, lower alkyl, lower alkoxy, nitro or halogenated benzyloxy; provided that Z^1 and Z^2 are not both hydrogen.

3. A compound of the formula



wherein A represents alkylene having 2–8 carbon atoms which may have at least one methyl group and wherein the adjacent nitrogen atoms of urazole radical are bonded to different carbons of the A group, and R represents phenyl having at least one substituent selected from halogen, lower alkyl having 1–4 carbon atoms, lower alkoxy having 1–4 carbon atoms, nitro, monochlorobenzyloxy, or trifluoromethyl; or naphthyl; or a compound of the formula



wherein A′ represents alkylene having 2–8 carbon atoms, or butenylene which may have at least one methyl group as a side chain and wherein the adjacent nitrogen atoms of the urazole radical are bonded to different carbons of the A′ group, Y represents oxygen or sulfur, but when A′ is butenylene Y is sulfur, and R′ represents phenyl which is substituted with up to three halogens, lower alkyl having 1–4 carbon atoms, lower alkoxy having 1–4 carbon atoms, nitro, halogenated benzyloxy or trihalomethyl; or napthyl.

4. A herbicidal composition consisting essentially of an effective amount of a compound of claims 1, 2 or 3 in combination with an inert agricultural adjuvant.

4,249,935

HERBICIDAL AGENTS

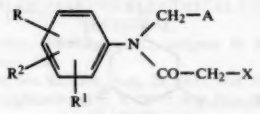
Hanspeter Hansen, Ludwigshafen; Karl Eicken, Wachenheim, and Bruno Wuerzer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 12, 1979, Ser. No. 56,949

Int. Cl.³ A01N *9/02*

U.S. Cl. 71—92 **9 Claims**

1. A herbicidal agent containing a herbicidally effective amount of a substituted acetanilide of the formula



where R denotes hydrogen, linear or branched alkyl or alkoxy of up to 5 carbon atoms, R^1 denotes hydrogen, halogen, or linear or branched alkyl or alkoxy of up to 5 carbon atoms, R^2 denotes hydrogen, halogen, or linear or branched alkyl or alkoxy of up to 5 carbon atoms, R together with R^2 denotes an alkylene chain of up to 6 carbon atoms which is linked in the o-position and may be substituted by linear or branched alkyl of up to 4 carbon atoms, X denotes chlorine or bromine, and A denotes azole selected from the group consisting of pyrrole, pyrazole, imidazole, 1,2,4-triazole, 1,2,3-triazole and tetrazole, which is attached via a ring nitrogen atom and may be mono- or polysubstituted by halogen, phenyl, alkyl, alkoxy, alkylthio or perfluoroalkyl, each of up to 4 carbon atoms, cyano, carboxy, carbalkoxy of up to 4 carbon atoms in the alkoxy, or alkanoyl of up to 4 carbon atoms, or A denotes a salt of one of said unsubstituted or substituted azoles containing 2 or 3 nitrogen atoms and an antidotally effective amount of N-dichloroacetyl-2,2-dimethyl-1,3-oxazolidine, the ratio of acetanilide to N-dichloroacetyl-2,2-dimethyl-1,3-oxazolidine is from 1:2 to 1:0.01 parts by weight.

4,249,936

ESTERS OF 2-CARBOXY-3-AZABICYCLO-(3.1.0)HEX-2-ENE

Robert J. G. Searle, and Janet A. Day, both of Sittingbourne, England, assignors to Shell Oil Company, Houston, Tex.

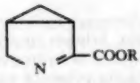
Filed Dec. 7, 1979, Ser. No. 101,992

Claims priority, application United Kingdom, Dec. 14, 1978, 48489/78; Mar. 12, 1979, 08615/79

Int. Cl.³ A01N *43/38;* **C07D** *209/52*

U.S. Cl. 71—95 **7 Claims**

1. An ester of the formula



wherein R contains from 1 to 10 carbon atoms and is unsubstituted alkyl, alkenyl, alkynyl, phenyl or phenalkyl, or such substituted by one or more of halogen, alkyl and alkoxy.

4,249,937

CYCLOHEXANE DERIVATIVES

Isao Iwataki; Masami Shibuya; Hisao Ishikawa, all of Odawara, and Takashi Kawana, Ohiso, all of Japan, assignors to Nippon Soda Company, Ltd., Tokyo, Japan

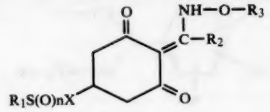
Filed Apr. 20, 1978, Ser. No. 898,110

Claims priority, application Japan, May 23, 1977, 52-58738; Sep. 20, 1977, 52-112945; Nov. 16, 1977, 52-136765; Feb. 28, 1978, 53-22406

Int. Cl.³ E05B *65/08*

U.S. Cl. 71—97 **25 Claims**

1. A compound selected from the group consisting of (a) a cyclohexane derivative of the general formula



wherein

R_1 is selected from the group consisting of lower alkyl, benzyl, phenyl and substituted phenyl with chlorine, methyl or methoxy,

R_2 is lower alkyl,

R_3 is selected from the group consisting of lower alkyl and lower alkenyl,

X is straight or branched alkylene having 2 or 3 carbon atoms, and

n is 0, 1 or 2, and

(b) a metal salt of the cyclohexane derivative in (a) wherein the metal is selected from the group consisting of sodium, calcium, copper and iron.

9. A herbicidal composition, comprising an inert carrier and an effective amount of a compound of claim **1**.

4,249,938

N-PHENYL-N-METHYL-UREA DERIVATIVES, AND THEIR PRODUCTION AND USE

Ichiki Takemoto, Osaka; Seizo Sumida, Hyogo; Ryo Yoshida, Kawanishi, and Katsuzo Kamoshita, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

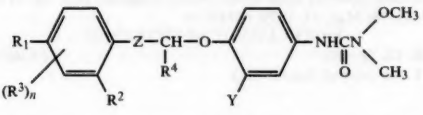
Filed Jun. 27, 1978, Ser. No. 919,683

Claims priority, application Japan, Jun. 28, 1977, 52-77400; Jul. 22, 1977, 52-88742; Feb. 28, 1978, 53-23026; Mar. 10, 1978, 53-27926

Int. Cl.[3] **A01N** *47/30, 31/08;* **C07C** *119/20, 127/19*

U.S. Cl. 71—98 **14 Claims**

1. A compound of the formula:



wherein R^1, R^2 and R^3 are each hydrogen, lower alkyl, lower alkoxy, lower alkylthio, halogen or trifluoromethyl, R^4 is hydrogen or lower alkyl, Y is hydrogen or halogen, Z is a straight or branched alkylene chain of not more than 8 carbon atoms or an alkylene chain of not more than 8 carbon atoms having one or two atoms of oxygen and/or sulfur inside and/or at the end thereof, and n is an integer of 1 to 3, with the following provisos:

(a) when R^1 is lower alkyl or lower alkoxy, R^2 is hydrogen or methyl, R^4 is hydrogen, Y is hydrogen and Z is methylene, R^3 is lower alkyl, lower alkoxy, halogen or trifluoromethyl;

(b) when R^1 is hydrogen, halogen or trifluoromethyl, R^4 is hydrogen, Y is hydrogen and Z is methylene, R^2 and R^3 are each hydrogen, lower alkyl, lower alkoxy, halogen or trifluoromethyl;

(c) when R^4 is hydrogen, Y is halogen and Z is methylene, R^1, R^2 and R^3 are each hydrogen, lower alkyl, lower alkoxy, halogen or trifluoromethyl;

(d) when R^4 is hydrogen, Z is a straight or branched alkylene chain of 2 to 8 carbon atoms or a straight or branched alkylene chain of 1 to 7 carbon atoms having one or two atoms of oxygen and/or sulfur inside and/or at the end thereof; and

(e) when R^4 is lower alkyl, Z is a straight or branched alkylene chain of 1 to 8 carbon atoms or a straight or branched chain of 1 to 7 carbon atoms having one or two atoms of oxygen and/or sulfur inside and/or at the end thereof.

4,249,939

METHOD OF DISPOSING OF SPENT ORGANIC COMPLEXING SOLUTIONS CONTAINING CUPROUS HALIDES

Christopher P. Christenson; Gary M. McNamee, and Ralph H. Delaune, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 952,748, Oct. 19, 1978, abandoned. This application Jan. 3, 1980, Ser. No. 109,376

Int. Cl.[3] **C22B** *15/12*

U.S. Cl. 75—109 **10 Claims**

1. A process for removing copper from spent cuprous aluminum tetrahalide complexing solutions which process comprises:

(1) mixing said complexing solution with at least about 0.5 parts of water per part of complexing solution, thereby forming a solid precipitate of cuprous halide, an organic phase and an aqueous phase;

(2a) contacting, while agitating, the mixture of step (1) with a suitable oxidizing agent in a sufficient quantity for a time sufficient to convert the water insoluble cuprous halide to water soluble cupric halide; and separating the organic phase and the aqueous phase; or alternatively

(2b) separating the organic phase and the aqueous phase and contacting, while agitating, the aqueous phase containing the insoluble cuprous halide with a suitable oxidizing agent in a suitable quantity for a time sufficient to convert the water insoluble cuprous halide to water soluble cupric halide;

(3) contacting the aqueous phase containing the dissolved cupric halide with an environmentally acceptable metal higher than copper in the electromotive series thereby precipitating copper metal and

(4) recovering by any suitable means, the precipitated copper metal.

4,249,940

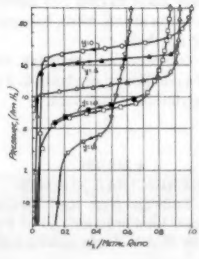
MISCHMETAL-NICKEL-IRON HYDROGEN STORAGE COMPOUND

Gary D. Sandrock, Ringwood, N.J., and Stephan L. Keresztes, Warwick, N.Y., assignors to The International Nickel Co., Inc., New York, N.Y.

Filed Jan. 8, 1979, Ser. No. 1,548

Int. Cl.[3] **C22C** *19/03*

U.S. Cl. 75—122 **4 Claims**



1. A compound capable of combining with hydrogen to form a hydride consisting essentially of $MNi_{x-y}Fe_y$, wherein M is mischmetal, x is a number between about 4.5 and 5.5 and y is a number between about 0.1 and 1.3.

4,249,941

COPPER BASE ALLOY FOR LEADS OF INTEGRATED CIRCUIT

Rensei Futatsuka, and Tadao Sakakibara, both of Aizuwakamatsu, Japan, assignors to Tamagawa Kikai Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 13, 1979, Ser. No. 93,923
Claims priority, application Japan, Nov. 20, 1978, 53-142290
Int. Cl.³ C22C 9/02
U.S. Cl. 75—153 1 Claim

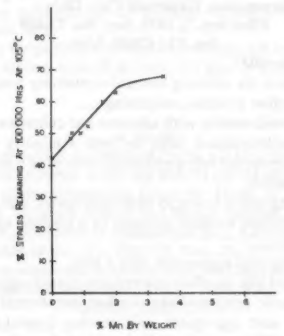
1. A copper base alloy for leads of an integrated circuit, which consists of from 0.5 to 1.5% by weight of iron, from 0.5 to 1.5% by weight of tin, from 0.01 to 0.35% by weight of phosphorus, and the balance of copper and inevitable impurities.

4,249,942

COPPER BASE ALLOY CONTAINING MANGANESE AND COBALT

Eugene Shapiro, Hamden; John M. Vitek, Cheshire, and Warren F. Smith, Jr., Branford, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Sep. 11, 1979, Ser. No. 74,535
Int. Cl.³ C22C 9/04
U.S. Cl. 75—157.5 10 Claims



1. A copper base alloy having improved stress relaxation resistance consisting essentially of: about 10.0 to 31% zinc; about 1.0 to 5.0% aluminum; about 0.1 to 3.0% cobalt; about 0.5 to 8% manganese and the balance essentially copper.

4,249,943

NON-PRECIOUS CERAMIC ALLOY

M. Hamdi A. Mohammed, Gainesville, Fla.; Dwarika P. Agarwal, Williamsville, and Clyde E. Ingersoll, Tonawanda, both of N.Y., assignors to Williams Gold Refining Company Incorporated, Buffalo, N.Y.

Filed Oct. 11, 1978, Ser. No. 950,430
Int. Cl.³ C22C 19/05
U.S. Cl. 75—171 6 Claims

1. An alloy for dental use consisting essentially of the following constituents in the indicated percentages by weight: aluminum 1.0–3.0%, cobalt 0–20.0%, chromium 10.0–20.0%, manganese 0.5–1.5%, molybdenum 6.0–18.0%, nickel 58.5–77.0% and silicon 0.5–2.0%, with the proviso that the total of said manganese and said silicon is at least 1.0%, but no more than 3.5%.

4,249,944

METHOD OF MAKING ELECTRICAL CONTACT MATERIAL

Gerald J. Witter, Waukegon, Ill., assignor to Fansteel Inc., North Chicago, Ill.

Division of Ser. No. 827,590, Aug. 25, 1977, Pat. No. 4,162,160.
This application Apr. 9, 1979, Ser. No. 28,541
Int. Cl.³ B22F 1/00
U.S. Cl. 75—211 10 Claims

1. A method of making a powder for compacting and sintering comprising the steps of blending a powder mixture which includes a particulate electrically conductive metallic constituent in the amount of about 20% to 50% by weight, a particulate nickel constituent in the amount of about 2% to 13% by weight and the remainder a particulate refractory metallic constituent, each of said constituents having an average Fisher sub-sieve particle size not greater than about 10 μm, agglomerating said blended powder mixture with water, baking said agglomerated powder mixture to form aggregates thereof, and deaggregating said baked mixture to form a powder which will pass through a 60 mesh screen.

4,249,945

POWDER-METALLURGY STEEL ARTICLE WITH HIGH VANADIUM-CARBIDE CONTENT

Walter T. Haswell, Jamesville, N.Y., and August Kasak, Pittsburgh, Pa., assignors to Crucible Inc., Pittsburgh, Pa.

Filed Sep. 20, 1978, Ser. No. 944,514
Int. Cl.³ B22F 5/00
U.S. Cl. 75—241 3 Claims

1. A powder metallurgy article formed from compacted prealloyed powder of an alloy consisting essentially of, in weight percent, manganese 0.2 to 1.5, silicon 2 max., chromium 1.5 to 6, molybdenum 0.50 to 6, sulfur 0.30 max., vanadium 6 to 11, carbon 1.6 to 2.8, balance iron and incidental elements and impurities characteristic of steelmaking practice, said article having a dispersion of substantially all MC-ype vanadium carbides within the range of about 10 to 18 percent by volume, whereby said article is characterized by improved wear resistance with toughness and workability at acceptable levels, said carbides being substantially spherical and uniformly distributed, said carbon being balanced with the chromium, molybdenum and vanadium to provide sufficient carbon to permit said article to be heat treated to a hardness of at least 56 R_c.

4,249,946

DETERGENT-DURABLE GLASSES

Paul S. Danielson, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Nov. 2, 1979, Ser. No. 90,514
Int. Cl.³ C03C 3/08
U.S. Cl. 106—54 2 Claims

1. A transparent glass displaying exceptional resistance to attack by detergents, i.e., displaying no iridescence after immersion for 20 hours at 95° C. in an aqueous solution containing 12.6 grams $Na_2CO_3.H_2O$, 12.6 grams $Na_4P_2O_7.10H_2O$, and 4.8 grams $Na_2SiO_3.9H_2O$ made up with distilled water to one liter, having a softening point in excess of 770° C., and a coefficient of thermal expansion (20°–300° C.) ranging between about 65–75$\times 10^{-7}$/°C. which consists essentially, expressed in weight percent on the oxide basis as calculated from the batch, of:

Na_2O	8.7–10.1
K_2O	0–1.7
$Na_2O + K_2O$	8.7–10.7
Al_2O_3	7.9–8.6
B_2O_3	3.8–4.7
CaO	6.0–10.2
MgO	0.1–2.2
BaO	0–5.6
ZnO	0–3.1

-continued

CaO + MgO + BaO + ZnO	8.2–12.5
SiO_2	65.9–70.0

4,249,947

REPAIRING MORTARS FOR SILICON CARBIDE BRICKS

Haruyoshi Koga, Hachinohe, Japan, assignor to Hachinohe Smelting Co., Ltd., Tokyo, Japan

Filed Jul. 27, 1979, Ser. No. 61,551
Claims priority, application Japan, Jul. 3, 1979, 54-83484
Int. Cl.[3] C04B *35/48*
U.S. Cl. 106—57 5 Claims

1. A repairing mortar for silicon carbide bricks comprising about 60–85% by weight of zircon, about 0.5–2.0% by weight of borates or boric acid, about 3–10% by weight of phosphoric acid, about 0.5–2.0% by weight of colloidal silica and 0–20% by weight of agalmatolite or kaolin.

4,249,948

ADDITIVE FOR AIR-ENTRAINED CONCRETE OR AIR-ENTRAINED MORTAR

Eisaburo Okada, Wakayama, and Koji Sakagami, Kainan, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Sep. 12, 1979, Ser. No. 74,627
Claims priority, application Japan, Sep. 25, 1978, 53-117682
Int. Cl.[3] C04B *21/00*
U.S. Cl. 106—88 10 Claims

1. In a hydraulic cement composition for making concrete or mortar, comprising hydraulic cement, water and, optionally, aggregate, the improvement which comprises: said composition contains (A) an effective amount of α-olefin sulfonate for entraining air in said composition and (B) an effective amount of water-reducing agent selected from the group consisting of (1) condensate of formaldehyde with sulfonated creosote oil petroleum decomposition product, (2) high molecular weight condensate of formaldehyde with β-naphthalene sulfonic acid and (3) high molecular weight condensate of formaldehyde with sulfonated melamine, with the provisos that when said water-reducing agent (B) is (1) or (2), the weight ratio of A/B is in the range of from 0.19/100 to 10/100, and when said water-reducing agent (B) is (3), the weight ratio of A/B is in the range of from 0.095/100 to 5/100.

4,249,949

METHODS FOR CONSOLIDATING RADIOACTIVE WASTE MATERIAL USING SELF-SETTING OR WATER-SETTABLE COMPOSITIONS CONTAINING AN ORGANIC POLYISOCYANATE, A NON-IONIC SURFACE ACTIVE AGENT DEVOID OF ISOCYANATE-REACTIVE GROUPS AND ALKALINE FILLER

Alan M. Wooler, Manchester, England, and Olle Bengtson, Gothenburg, Sweden, assignors to Imperial Chemical Industries Limited, London, England

Filed May 14, 1979, Ser. No. 38,709
Claims priority, application United Kingdom, May 18, 1978, 20430/78
Int. Cl.[3] G21F *9/00*
U.S. Cl. 106—90 8 Claims

1. A method of consolidating a radioactive waste material which comprises bringing the radioactive waste material into admixture with an organic polyisocyanate; a non-ionic surface active agent devoid of isocyanate-reactive groups; and an alkaline filler in the presence of water.

4,249,950

METHOD OF MAKING FLEXIBLE CEMENTITIOUS MATERIALS

John Hurst, London, England, assignor to W. R. Grace & Co. Ltd., London, England

Filed Jun. 5, 1979, Ser. No. 45,801
Claims priority, application United Kingdom, Jun. 14, 1978, 26874/78
Int. Cl.[3] C04B *7/35*
U.S. Cl. 106—90 16 Claims

1. A method of producing an improved flexible cementitious material comprising the steps of

(a) mixing an aqueous dispersion of elastomeric polymer with a cement capable of hardening upon mixture with water;

(b) forming the resulting mixture into a hardened mass;

(c) compressing the hardened mass by subjecting it to pressure sufficient to reduce the brittleness thereof and to increase the flexibility thereof yet retaining the utility of the hardened mass; and

(d) thereafter removing said pressure and recovering said improved flexible cementitious material.

4,249,951

PROCESS FOR UTILIZING MINERAL-CONTAINING RESIDUE FROM COAL LIQUEFACTION PROCESSES

Robert E. Leonard, Oklahoma City, Okla., assignor to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed Sep. 7, 1979, Ser. No. 73,469
Int. Cl.[3] C04B *7/36*
U.S. Cl. 106—103 7 Claims

1. A process for utilizing mineral-containing residue from a coal liquefaction process comprising:

admixing said residue with siliceous and calcareous materials in a predetermined ratio to form a mixture capable of being converted into a hydraulic cement of a selected final composition;

compacting said mixture to form aggregates, said aggregates being formed without addition of a binding agent to said mixture;

introducing said aggregates into a kiln;

heating said kiln to effect conversion of said aggregates into a hydraulic cement clinker without substantial disintegration of said aggregates, said residue in said aggregates substantially providing all of the heat for said conversion by combustion of carbonaceous material contained in said residue;

removing said clinker from said kiln; and

grinding said clinker to provide a hydraulic cement of said selected final composition.

4,249,952

METHOD FOR PRODUCING CEMENT CLINKER FROM CEMENT KILN WASTE DUST

Howard F. Davis, Jr., Pittsburgh, and John A. Persson, Gibsonia, both of Pa., assignors to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Filed Mar. 3, 1980, Ser. No. 126,189
Int. Cl.[3] C04B *7/36*
U.S. Cl. 106—103 9 Claims

1. A method of recovering useful products from rotary cement kiln waste dust having an alkali content above that required for the production of cement clinker comprising the steps of:

collecting said dust;

introducing said dust to an electric arc furnace; and

heating said dust in said furnace to a temperature sufficient to form a melt having desirable cement clinker properties and to volatilize alkali sulfates therefrom.

4,249,953

AIR PORE LACQUERS CONTAINING WHITE PIGMENTS OR WHITE FILLERS

Siegfried Keifer, and Hans G. Völz, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 598,603, Jul. 24, 1975. This application Jan. 17, 1977, Ser. No. 760,216

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1974, 2439549

Int. Cl.[3] C08K *3/22;* C08L *1/08*

U.S. Cl. 106—193 R 11 Claims

1. An air pore film comprising a binder, air pores, and at least one additive which is a white pigment or white filler, the additive having an average particle size $\bar{D}_{zv}$ which is at least about 10% smaller than the optimum average particle size for maximum scattering power for the same binder free from air pores.

4,249,954

POZZOLANIC PRODUCT PRODUCED FROM BAGASSE ASH

Boyd T. Keogh, 4 Adrian Pl., Balgowlah Heights, New South Wales, Australia (2093)

Filed Oct. 13, 1978, Ser. No. 951,082

Claims priority, application Australia, Oct. 14, 1977, PD2067

Int. Cl.[3] C09C *1/28*

U.S. Cl. 106—288 B 6 Claims

1. A process for manufacturing a pozzolanic material, comprising:

procuring unprocessed bagasse ash,

removing substantially all unburnt organic material from said ash, and

reducing the particle size of the remaining ash so that the ash has a surface area of at least 300 square meters per kilogram.

4,249,955

FLOWABLE COMPOSITION ADAPTED FOR SINTERING AND METHOD OF MAKING

George P. Grab, Greensburg; Grant W. Hood, Jr., Stahlstown; Sigurd A. Swanson, Export, and Bela J. Nemeth, Greensburg-,all of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Continuation of Ser. No. 854,775, Nov. 25, 1977, abandoned, which is a continuation of Ser. No. 409,728, Oct. 25, 1973, abandoned. This application Jan. 7, 1980, Ser. No. 109,924

Int. Cl.[3] C04B *25/04*

U.S. Cl. 106—308 Q 9 Claims

1. A composition for use in making rigid articles by sintering and comprising: a flowable mixture of sinterable powdered material and a liquid vehicle for the powdered material said vehicle comprising a small but effective amount of a surface active agent, a fugitive binder and a solvent therefor, said solvent evaporating below 200° F., said fugitive binder being gassifiable without leaving any substantial residue and said fugitive binder volatilizing at a temperature substantially below the sintering temperature of the powdered material.

4,249,956

METHOD OF REMOVING PAINT FROM A BRICK SURFACE

Charles N. Hartman, 944 Algonquin Rd., Niskayuna, N.Y. 12309

Filed Aug. 1, 1979, Ser. No. 62,735

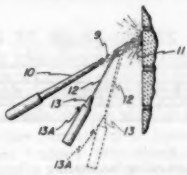
Int. Cl.[3] B08B *7/00;* B24C *1/00*

U.S. Cl. 134—7 6 Claims

1. The pressure grit washing process of removing paint from a brick surface without damaging the brick, said brick being of the type having a bisque, which comprises the steps of:

directing a stream of water, said stream having a longitudinal axis, at high velocity against the paint adhering to the brick;

directing a relatively low-velocity stream of fine particle abrasive material into the water stream from a nozzle while varying the angle and distance between the nozzle and the water stream, said angle ranging from 30° to 90° to the longitudinal axis thereof; and



discontinuing contact of the water stream with the brick substantially as soon as the paint has all been removed from the brick surface.

4,249,957

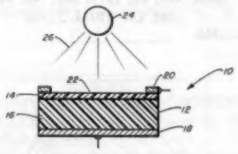
COPPER DOPED POLYCRYSTALLINE SILICON SOLAR CELL

Alan M. Lovelace, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Krishna M. Koliwad, La Canada, and Taher Daud, La Crescenta, both of Calif.

Filed May 30, 1979, Ser. No. 43,941

Int. Cl.[3] H01L *31/06*

U.S. Cl. 136—258 4 Claims



1. A photovoltaic solar cell comprising: a polycrystalline silicon body having a grain size from 100°A to 0.05 mm doped with an element providing a first conductivity type and also containing 10^{14} to 10^{15} atoms per cc of copper segregated at the grain boundaries and further comprising a surface layer of opposite conductivity type and electrode means directly connected to each of said conductivity portions of the body.

4,249,958

PANEL COMPRISING AT LEAST ONE PHOTO-VOLTAIC CELL AND METHOD OF MANUFACTURING SAME

Pol Baudin, Fontaine-l'Eveque; Lucien Leger, Montigny-le-Tilleul, and Pierre Collignon, Marcinelle, all of Belgium, assignors to BFG Glassgroup, Paris, France

Filed Jun. 7, 1979, Ser. No. 46,320

Claims priority, application United Kingdom, Jun. 14, 1978, 26973/78

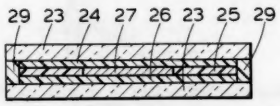
Int. Cl.[3] H01L *31/04*

U.S. Cl. 136—251 17 Claims

1. A method of manufacturing a panel of the kind which comprises at least one photo-voltaic cell located between a transparent sheet and a second sheet, said method comprising: bonding said sheets together with the voltaic cell therebetween by assembling between the sheets a laminating adhesive in the form of at least one film of polyvinylbutyral which has been cut to an area less than that of either of said sheets so that in the assembled bonded form there is a peripheral groove around the assembly, and filling the peripheral groove with another adhe-

sive material applied at least in part between the sheets to form a moisture barrier which surrounds said photo-voltaic cell and said first-mentioned adhesive.

13. A panel comprising at least one photo-voltaic cell located between a transparent sheet and a second sheet bonded



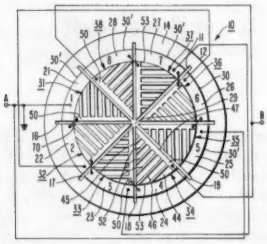
together by an intervening laminating adhesive layer of polyvinylbutyral and a body of another adhesive material surrounding said cell and said laminating adhesive, said body being located at least in part between the sheets and forming a moisture barrier which surrounds said cell and said laminating adhesive.

4,249,959

SOLAR CELL CONSTRUCTION

Robert W. Jebens, Skillman, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 28, 1979, Ser. No. 98,244
Int. Cl.³ H01L *31/00*
U.S. Cl. 136—244 **13 Claims**



1. A solar cell construction comprising:

an insulating base layer having a perimeter of a first magnitude,

a plurality of spaced coplanar solar cell generators, each comprising a layer of semiconductor material having a base region of a first conductivity type and an emitter region of a second conductivity type, the generators having an outer edge forming an array perimeter of a second magnitude less than said first magnitude,

a like plurality of spaced coplanar electrode layers, each layer being secured between a separate, different one of said generator base regions and said base layer,

the edges of said electrode layers lying in spaced relation,

the electrode layers having an outer edge forming an array perimeter of a third magnitude less than said first magnitude and greater than said second magnitude, the electrodes extending beyond each said generator in a region between the corresponding generator and base layer perimeters forming a first cell electrode, and

a metallized electrode structure on the light incident cell face of each cell forming a second cell electrode for each generator.

4,249,960

LASER ROUNDING A SHARP SEMICONDUCTOR PROJECTION

George L. Schnable, Lansdale, Pa., and Chung P. Wu, Mercerville, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jun. 18, 1979, Ser. No. 49,597
Int. Cl.³ H01L *21/263, 21/268*
U.S. Cl. 148—1.5 **8 Claims**

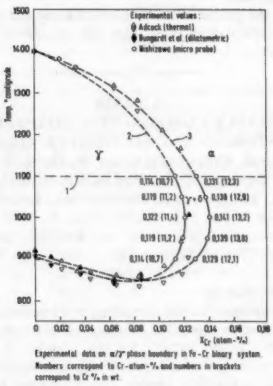
1. A method of rounding a sharp semiconductor projection on a principal body of semiconductor material comprising the step of irradiating said projection with a laser pulse having an energy density of less than about 1.5 joules/cm^2.

4,249,961

HIGH STRENGTH STEEL FOR DIFFUSION CHROMIZING

Harri Nevalainen, Terästehdas B 88/A8, 55610 Imatra 61, Finland (55610)

Division of Ser. No. 763,130, Jan. 27, 1977, abandoned. This application Jul. 5, 1978, Ser. No. 922,220
Claims priority, application United Kingdom, Mar. 6, 1976, 9082/76
Int. Cl.³ C21D *1/48*
U.S. Cl. 148—14 **9 Claims**



Experimental data on α/γ phase boundary in Fe - Cr binary system. Numbers correspond to Cr - atom - % and numbers in brackets correspond to Cr % in wt.

1. A process for making high strength steel having a chrome diffusion zone extending from its surface comprising the steps of:

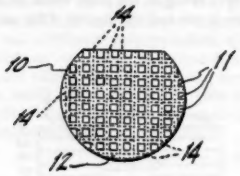
(a) providing a low carbon content steel consisting essentially of the following composition (weight percent):
carbon: 0.01 to 0.08%
silicon: 0.1 to 1.0%
manganese: 0.5 to 2.2%
chromium: from more than 2.0 to 10%
molybdenum: 0.01 to 0.4%
aluminum: 0.002 to 0.05%
carbide former: up to 1%
iron: balance including normal impurities; and

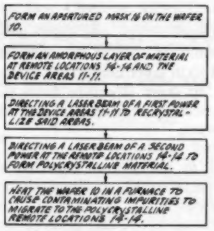
(b) subjecting said low carbon content steel to a chromium containing environment for a time and at an elevated temperature sufficient to diffuse chromium atoms into the surface of said low carbon steel and forming a diffusion zone or layer in said steel surface which is richer in chromium when compared against the rest of said steel.

4,249,962
METHOD OF REMOVING CONTAMINATING IMPURITIES FROM DEVICE AREAS IN A SEMICONDUCTOR WAFER

George K. Celler, Lawrence, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Sep. 11, 1979, Ser. No. 74,443
Int. Cl.³ H01L *21/265*
U.S. Cl. 148—1.5 20 Claims




FORM AN APERTURED MASK 16 ON THE WAFER 10.
FORM AN AMORPHOUS LAYER OF MATERIAL AT REMOTE LOCATIONS 14-14 AND THE DEVICE AREAS 11-11.
DIRECTING A LASER BEAM OF A FIRST POWER AT THE DEVICE AREAS 11-11 TO RECRYSTALLIZE SAID AREAS.
DIRECTING A LASER BEAM OF A SECOND POWER AT THE REMOTE LOCATIONS 14-14 TO FORM POLYCRYSTALLINE MATERIAL.
HEAT THE WAFER 10 IN A FURNACE TO CAUSE CONTAMINATING IMPURITIES TO MIGRATE TO THE POLYCRYSTALLINE REMOTE LOCATIONS 14-14.

1. A method of fabricating a plurality of device areas, substantially free of contaminating impurities and damage, in a semiconductor wafer, comprising the steps of:

(a) forming a plurality of device areas in the wafer wherein the device areas may be damaged during the formation thereof and may include contaminating impurities;

(b) forming damaged remote locations on the wafer to which the contaminating impurities will migrate and be trapped upon application of heat to the wafer;

(c) selectively recrystallizing the damaged device area; and

(d) heating the wafer for a time and at such a temperature to cause the contaminating impurities to migrate from the device areas to the remote locations.

4,249,963
METHOD FOR IMPROVING A PROPERTY OF AN ALLOY

William R. Young, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Jul. 23, 1979, Ser. No. 59,796
Int. Cl.³ C21D *1/74*; C22F *1/02*
U.S. Cl. 148—16 1 Claim

1. A method for improving a property of an article fabricated with a high temperature brazing alloy based on an element selected from the group consisting of Fe, Co and Ni, the brazing alloy including at least one melting point depressant element selected from the group consisting of Si and B, by depletion of the depressant element through a brazing alloy surface, comprising the steps of:

exposing the alloy surface to gaseous fluoride ions with which the depressant element will react to form a gaseous compound, while

heating the brazing alloy at a temperature less than that which will affect detrimentally material of the article and generally at or below the brazing alloy melting temperature, for a time sufficient for the depressant element to diffuse to the alloy surface and to react with the gaseous fluoride ions to form a gaseous fluoride compound of the element, the gaseous compound separating from the surface, thereby to deplete the alloy of the element.

4,249,964
PROCESS FOR THE CHEMICAL AND THERMAL TREATMENT OF STEEL PARTS TO IMPROVE THE STRENGTH PROPERTIES THEREOF

Tadeusz Bambuch; Henryk Wilusz; Wieslaw Englert; Stanislaw Czank, and Stanislaw Surmiak, all of Stalowa Wola, Poland, assignors to Huta Stalowa Wola-Kombinat Przemyslowy, Stalowa Wola, Poland

Continuation-in-part of Ser. No. 28,484, Apr. 9, 1979, abandoned. This application Mar. 31, 1980, Ser. No. 136,137
Int. Cl.³ C21D *1/48*
U.S. Cl. 148—16.5 5 Claims

1. A process for improving the strength, hardness and surface properties of a steel part by a chemical and thermal treatment of the parts which comprises the steps of phosphatizing, carburizing, hardening and tempering the parts carried out in the following sequential order:

(1) phosphatizing the part by treatment with an acidic phosphatizing solution containing zinc ions and phosphate ions to produce on the part a coating ranging in thickness from 5 to 20 microns, the main ingredient of the coating being zinc phosphate;

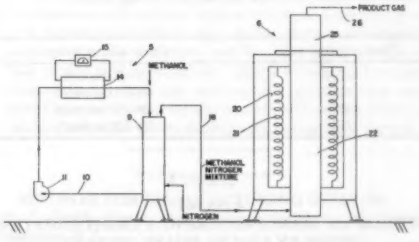
(2) carburizing the resulting phosphatized part in a gaseous carbon-containing atmosphere; and

(3) hardening the part until the superficial layer is substantially all martensite and finally tempering the part.

4,249,965
METHOD OF GENERATING CARRIER GAS

Thomas J. Schultz, Toledo, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Sep. 19, 1978, Ser. No. 943,821
Int. Cl.² B23K *35/24*
U.S. Cl. 148—27 9 Claims



1. A method of generating a carrier gas for use in a carburizing process, the gas having a composition of approximately 40% nitrogen, 40% hydrogen and 20% carbon monoxide comprising the steps of:

mixing gaseous nitrogen and liquid methanol in a vaporizer;

vaporizing the methanol;

feeding the vaporized methanol and nitrogen mixture into a retort heated to between 400° F. and 1200° F. and containing a metal based catalyst selected from the group consisting of copper, nickel and platinum;

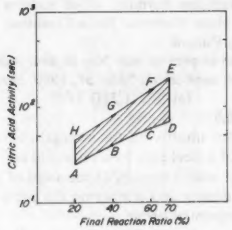
reacting the methanol in the retort to yield hydrogen and carbon monoxide;

passing the hydrogen, carbon monoxide and nitrogen out of the retort.

4,249,966
METHOD OF FORMING A FORSTERITE INSULATING FILM ON THE SURFACE OF A GRAIN-ORIENTED SILICON STEEL SHEET

Toshio Ichida; Michiro Komatsubara, both of Chiba, and Hiroshi Shimanaka, Funabashi, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Oct. 19, 1979, Ser. No. 86,453
Claims priority, application Japan, Oct. 25, 1978, 53-131133
Int. Cl.[3] C23C 3/04
U.S. Cl. 148—113 1 Claim



1. In a method of forming a forsterite insulating film on the surface of a grain-oriented silicon steel sheet in a high adhesion, wherein an annealing separator consisting mainly of magnesia is applied on the surface of a grain-oriented silicon steel sheet, the steel sheet is wound up in the form of a coil, and the steel sheet is subjected to a final annealing, the improvement comprising using, as the annealing separator, a low-activity magnesia having a specified narrow activity distribution defined by a citric acid activity of magnesia, which varies within the range confined by the lines connecting the points A, B, C, D, E, F, G and H shown in FIG. 1 depending upon the variation of the final reaction ratio of the magnesia as determined by the method of measuring the citric acid activity of magnesia by mixing varying amounts of the magnesia with citric acid, said final reaction ratio of the magnesia being the ratio of the amount of magnesia finally reacted with citric acid to the total amount of the magnesia mixed therewith, said low-activity magnesia having citric acid activity which varies within the ranges defined by the following values:

Final reaction ratio	Citric acid activity
20%	25–45 seconds
40%	40–80 seconds
60%	60–150 seconds
70%	70–200 seconds

4,249,967
METHOD OF MANUFACTURING A LIGHT-EMITTING DIODE BY LIQUID PHASE EPITAXY

Yet-Zen Liu, Roanoke, Va., and Shang-Yi Chiang, Richardson, Tex., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 954,703, Oct. 25, 1978. This application Dec. 26, 1979, Ser. No. 106,632
Int. Cl.[3] H01L 21/208
U.S. Cl. 148—171 4 Claims

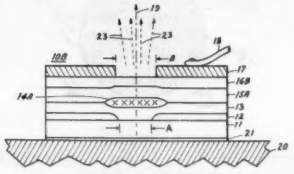
1. A method of making a small-area light-emitting diode structure of the surface-emitting type having a plurality of epitaxial semiconductor layers comprising the steps of:

selecting a substrate layer of n-type or p-type gallium arsenide compound having a surface area extending over the length and breadth of the desired diode structure;

growing in a furnace by liquid phase epitoxy on one surface of said substrate layer a thin blocking layer of doped semiconductor materials including gallium arsenide so as to form a junction of the opposite semiconductor type;

removing said two-layer structure from said furnace and etching a first small-area hole through said blocking layer down to the surface of said substrate layer;

placing said etched two-layer structure in said furnace and sequentially growing over said blocking layer a double heterostructure by liquid phase epitoxy comprising further doped semiconductor materials including gallium arsenide so as to form third, fourth, fifth and sixth layers, said third layer being of the same semiconductor type as said substrate layer and the fourth, fifth and sixth layers



being of the opposite type, said fourth layer comprising an active light-emitting layer in the completed diode structure and said sixth layer comprising a cap layer;

removing said six-layer structure from said furnace and depositing a metallic contacting layer on the upper surface of said cap layer;

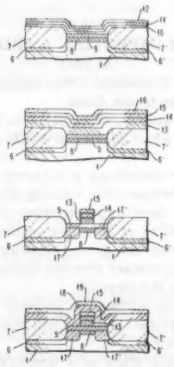
etching a second small-area hole, having a size approximately equal to the size of the first small-area hole, through said metal surface in alignment with said first hole on an axis perpendicular to the layer surfaces; and

bonding the other surface of said substrate layer to a metallic contacting and supporting means.

4,249,968
METHOD OF MANUFACTURING A METAL-INSULATOR-SEMICONDUCTOR UTILIZING A MULTIPLE STAGE DEPOSITION OF POLYCRYSTALLINE LAYERS

James R. Gardiner, Wappingers Falls; William A. Pliskin; Martin Revitz, both of Poughkeepsie, and Joseph F. Shepard, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1978, Ser. No. 974,577
Int. Cl.[3] H01L 21/20, 21/225
U.S. Cl. 148—174 13 Claims



1. A method of making a metal-oxide-semiconductor field-effect device and comprising the steps of:

providing a planar silicon body,
forming a thin silicon dioxide insulating layer on a surface of said body,
depositing a gate comprising a first intrinsic layer of polycrystalline silicon onto said silicon dioxide insulating layer,
increasing the thickness of said gate by depositing onto said first intrinsic polycrystalline layer at least one additional polycrystalline silicon layer together with the addition of a dopant,
subjecting said body to subsequent hot processing steps resulting incidentally in diffusion of a portion of the dopant from said additional polycrystalline silicon layer into and throughout said first polycrystalline silicon layer down to said silicon dioxide insulating layer, and
depositing a metal contact onto said gate and in superimposed vertical alignment with respect to said thin silicon dioxide insulating layer.

4,249,969

METHOD OF ENHANCING THE MAGNETIC PROPERTIES OF AN $Fe_aB_bSi_cC_d$ AMORPHOUS ALLOY

Nicholas J. DeCristofaro, Chatham; Alfred Freilich, Livingston, and Davidson M. Nathasingh, Parsippany, all of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 42,472, May 25, 1979. This application Dec. 10, 1979, Ser. No. 101,934
Int. Cl.³ C21D *1/04*
U.S. Cl. 148—108 **4 Claims**

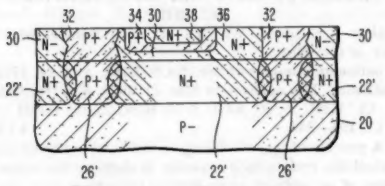
1. A method of enhancing the magnetic properties of a metal alloy which is at least 90% amorphous consisting essentially of a composition having the formula $Fe_aB_bSi_cC_d$ wherein "a", "b", "c" and "d" are atomic percentages ranging from about 80.0 to 82.0, 12.5 to 14.5, 2.5 to 5.0 and 1.5 to 2.5, respectively, with the proviso that the sum of "a", "b", "c" and "d" equals 100, which method comprises the step of annealing said alloy.

4,249,970

METHOD OF BORON DOPING SILICON BODIES

Marian Briska, and Klaus P. Thiel, both of Boeblingen, Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 20, 1979, Ser. No. 67,846
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1978, 2838928
Int. Cl.³ H01L *21/225*
U.S. Cl. 148—188 **11 Claims**



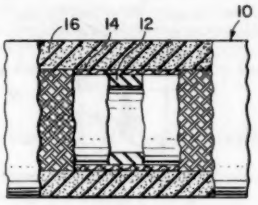
1. A method of doping a silicon body through diffusion of boron, comprising the steps of:
exposing said body to a gas mixture including BBr_3 and O_2 with said gas mixture formed at the coating temperature of BBr_3 and O_2 as contained in a flowing carrier gas such that the molar ratio of O_2:BBr_3 lies between 20 and 65 so as to thereby form a boron glass layer over said body with a silicon-rich boron layer being formed between said glass layer and body in selected areas of said body;
removing said boron glass layer so formed without adversely affecting said silicon-rich boron layer; and
heating said body so that at least a portion of the boron from said silicon-rich boron layer is driven into said silicon body to thereby selectively dope said silicon body.

4,249,971

PROCESS FOR MAKING ELASTOMERIC HOSE

Crescencio T. Yap, and Leonard Castelbaum, both of Mansfield, Ohio, assignors to Amerace Corporation, New York, N.Y.

Continuation of Ser. No. 634,264, Nov. 21, 1975, abandoned. This application Apr. 25, 1979, Ser. No. 33,253
Int. Cl.³ B32B *31/30, 33/00;* **F16L** *11/04, 11/08*
U.S. Cl. 156—143 **10 Claims**



1. A process for producing a composite elastromeric hose of one or more thermosetable materials and of reduced thermal conductivity, said hose having an inner tube vulcanized to a radially expanded outermost cover including a porous network formed therein, said process comprising the steps of:
(a) providing a first forming composition for forming said inner tube, said first forming composition including a thermosetable elastomer;
(b) providing a second forming composition for forming said radially expanded outermost cover, said second forming composition including a thermosetable elastomer and a blowing agent;
(c) forming said first forming composition into a first uncured tubular structure;
(d) forming said second forming composition into a second uncured tubular structure;
(e) disposing said second uncured tubular structure about said first uncured tubular structure to form an uncured hose structure of initial transverse external size determined by said second uncured tubular structure; and
(f) vulcanizing said uncured hose structure to form said hose in a heated environment and in the absence of external constraint while activating said blowing agent to expand said second tubular structure radially outwardly to a final transverse external size substantially greater than said initial transverse external size to form said porous network within said outer cover during said vulcanizing thereof.

4,249,972

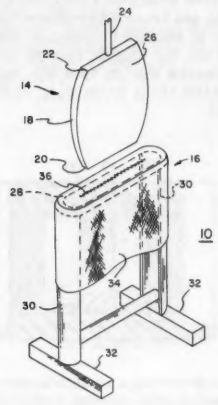
METHOD FOR MANUFACTURING GIRDLES

Harry J. Barth, Dover, Del., assignor to Abram N. Spanel, Princeton, N.J.

Filed Dec. 30, 1977, Ser. No. 866,092
Int. Cl.² B32B *31/20;* **B29H** *3/042;* **B32B** *25/10*
U.S. Cl. 156—165 **7 Claims**

1. A method for manufacturing girdles, comprising the steps of:
forming an adherable latex sheath on a flat form member having curved edges and being widest near the middle thereof;
placing a fabric liner having a substantially closed end over a frame member, the frame member having an opening comprising structure of two parallel sides and two joining ends and being of sufficient size to receive the form member which has two parallel sides,
moving the form member through the opening in the frame member, such that the circumferential interface between the form and the frame member remains constant for

approximately 93% of the total interface, thereby engaging the closed end of the liner, and pulling the liner through the opening in the frame member and into contact with the coated form member; and



transferring the fabric liner from the frame member to the coated form member.

4,249,973

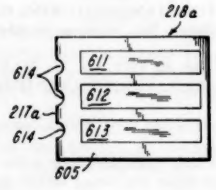
LABEL PRINTING AND APPLYING APPARATUS

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 540,051, Jan. 10, 1975, Pat. No. 3,952,652, which is a division of Ser. No. 312,454, Dec. 6, 1972, Pat. No. 3,968,745, which is a continuation-in-part of Ser. No. 208,035, Dec. 8, 1971, abandoned. This application Jan. 29, 1976, Ser. No. 653,403

Int. Cl.[3] **B41F** *1/02*

U.S. Cl. 156—216 **4 Claims**



1. Method of making a printing platen, comprising the steps of: providing a sheet of material having two sets of openings, inversely bending the sheet to provide two plate portions joined by a bight portion in which the sets of openings are in general alignment, there being moldable flexible resilient material between the plate portions, and causing the moldable material to fill the sets of openings.

4,249,974

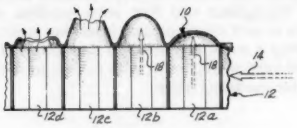
METHOD FOR RETICULATING AN ADHESIVE TO CONFORM TO A SURFACE OF AN APERTURED WORKPIECE

Paul H. Wilson, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 769,397, Feb. 16, 1977, abandoned, which is a continuation of Ser. No. 544,239, Jan. 27, 1975, abandoned. This application Aug. 24, 1978, Ser. No. 936,342

Int. Cl.[3] **B32B** *3/12, 31/16, 31/26*

U.S. Cl. 156—85 **11 Claims**



1. A method for reticulating an adhesive on a discontinuous surface of a workpiece prior to adhering a second workpiece to said surface, said discontinuous surface including a plurality of orifices extending from said surface or said workpiece, said method comprising the steps of:

(a) contacting said surface with a continuous film of adhesive so as to cover said surface and said orifices, said film of adhesive being characterized by a substantially uniform thickness, by a loss of cohesive strength upon heating, and by a tendency to contract when ruptured,

(b) causing said film to adhere to at least a portion of said surface of said workpiece surrounding said orifices,

(c) heating said film to a temperature lower than the melting temperature of said film to reduce the cohesive strength of said film, and, while maintaining the temperature of said film below the melting temperature of said film exerting a fluid pressure in said orifices to cause the portion of said film covering said orifices to distend outwardly away from said surface and to form bubbles, said fluid pressure being exerted until said bubbles rupture and said film contracts toward said surface to leave an adhesive bead on said surface adjacent the periphery of said orifices.

4,249,975

PROCESS OF MANUFACTURING ARTIFICIAL BREASTS

Cornelius Rechenberg, Weidach 22, 8204 Brannenburg, Fed. Rep. of Germany

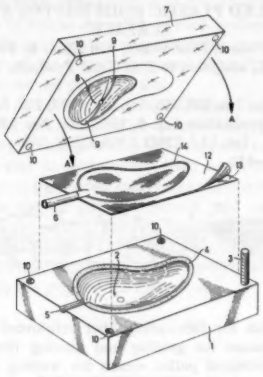
Continuation-in-part of Ser. No. 933,168, Aug. 14, 1978, abandoned. This application May 21, 1979, Ser. No. 40,636

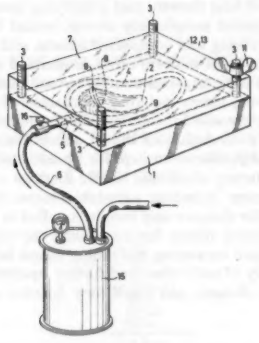
Int. Cl.[3] **B29C** *19/00;* **A41C** *3/10;* **B29C** *23/00;* **B29H** *9/00*

U.S. Cl. 156—245 **4 Claims**

1. A process of manufacturing an artificial breast consisting of a shell-like body which is similar in shape to the breast and consists of an addition cross-linking two-component silicone rubber composition and is enclosed in plastic material sheeting layers joined by welding, in which process a sheath of the artificial breast is formed by welding two flat layers of plastic material sheeting, except for a filling opening, along an edge which is to form the edge of the artificial breast, said layers are releasably fixed adjacent to the welded edge to the edge of the cavity in an open lower mold part of a two-part mold, of a breast which has an internal cavity that conforms to the contour of the artificial breast, the two-component silicone rubber composition is charged in a predetermined quantity which corresponds to the volume of the mold cavity through the charging opening left in the welded edge into the sheath formed by the layers of plastic material sheeting while the

lower mold part is at least partially open to provide to the charged sheath and thereafter the lower mold part is finally





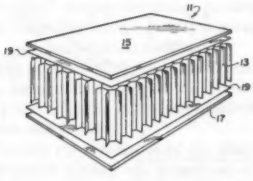
closed by the upper mold part and the composition is subjected to the vulcanizing treatment in the mold.

4,249,976

MANUFACTURE OF HONEYCOMB SANDWICH

Gordon F. Hudson, Huntington, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Apr. 4, 1979, Ser. No. 26,898
Int. Cl.[2] B32B *3/12*
U.S. Cl. 156—286 **14 Claims**



1. A continuous method of producing a honeycomb sandwich assembly comprising:

layering a sheet of thermoplastic adhesive upon a honeycomb core;

setting a layer of thermosetting laminae upon said adhesive sheet as to form an unbonded assembly consisting of said honeycomb core, said adhesive sheet and said laminae layer;

locally evacuating the space about the unbonded assembly;

heating the unbonded assembly in a pressurized oven to the laminate curing temperature while supporting said layer of laminae upon said thermoplastic sheet;

maintaining laminate curing temperature and pressure levels until the laminate is substantially cured;

increasing the temperature while decreasing the pressure level within the pressurized oven until the assembly reaches thermoplastic softening temperature and bonding pressure levels;

compressing said softened thermoplastic layer as to form a bond between said honeycomb core and said laminate;

decreasing the temperature below the thermoplastic softening level and post-curing the bonded assembly; and

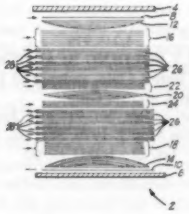
slowly cooling the bonded assembly to room temperature.

4,249,977

METHOD FOR MAKING CLOSE TOLERANCE LAMINATES

John T. Bartholomew, Coshocton, Ohio, assignor to General Electric Company, Worthington, Ohio

Filed Jul. 17, 1979, Ser. No. 58,194
Int. Cl.[3] B32B *31/00*; B65C *9/25*; B30B *5/02, 5/04*
U.S. Cl. 156—288 **10 Claims**



1. A method for making close tolerance laminates comprising the steps of positioning in horizontal planes in an open stack a plurality of sets of B-staged epoxy resin saturated fibrous sheets, each set being spaced apart from the adjacent set with a non-compressible planar spacer, and providing the top and bottom of each stack with a non-compressible contour pad, the stack-facing side of which is adapted to provide a horizontal pressure gradient ranging from higher at the center to lower at the edges when the stack is compressed and then compressing the open stack and applying heat to form a unitary close tolerance laminate from each said set of resin saturated fibrous sheets.

4,249,978

METHOD OF FORMING A HEAT RESISTANT CARTON

Thomas R. Baker, Los Altos, Calif., assignor to Kliklok Corporation, Greenwich, Conn.

Filed Apr. 19, 1979, Ser. No. 31,459
Int. Cl.[3] B32B *7/14*; C09J *5/04*
U.S. Cl. 156—291 **12 Claims**

1. A method of bonding a carton having at least a pair of mating surfaces to be sealed, the sealed surfaces exhibiting a high resistance to heat after sealing, comprising the steps of:

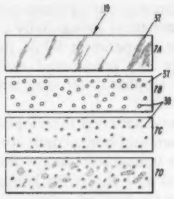
coating at least one of said carton surfaces with a heat-activated thermosetting adhesive;

applying a water-based adhesive emulsion exhibiting high contact tackiness when substantially dry on at least one of said surfaces to form a discontinuous film so that intermittent areas of said thermosetting adhesive are defined and exposed;

heating at least said water-based and thermosetting adhesive coated surfaces to a temperature sufficient to at least

partially dry said water-based adhesive and activate said thermosetting adhesive for sealing;

subsequently placing said mating carton surfaces in contact with each other;



setting said thermosetting adhesive against reactivation by heat after sealing; and

applying pressure for a time sufficient to seal said contacting surfaces together.

4,249,979

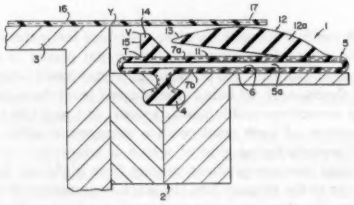
PLY FOLDING BLADDER

George J. Burley, Clinton, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 917,619, Jun. 16, 1978. This application May 7, 1979, Ser. No. 36,625

Int. Cl.[3] B29H *17/00*

U.S. Cl. 156—412 **6 Claims**



1. A bladder for forming an axial fold in the unvulcanized, rubbery overhang of ply material extending unsupported beyond the shoulder of a cylindrical drum, comprising:

an inflatable annular body located radially inwardly and axially outwardly of the shoulder;

means anchoring said body;

circumferentially spaced, axially inwardly directed lifting fingers on said body;

a circumferentially continuous wedge on said body between the shoulder and said fingers, said wedge having an axially inwardly facing surface in the uninflated condition of said body; and

inflation means to move said fingers initially to lift the overhang radially and axially outwardly, thereafter to establish a circumferential line of substantially fixed contact points between said fingers and the overhang; and to move said wedge radially outwardly initially to establish and maintain engagement between its said surface and a substantially fixed circumferential area of the overhang, thereafter to turn said surface and the area together radially inwardly, and fold the overhang.

4,249,980

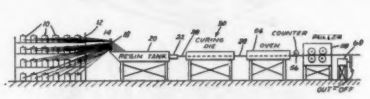
APPARATUS FOR FABRICATING IMPROVED FIBER REINFORCED PLASTIC RODS HAVING A SMOOTH SURFACE

Samuel M. Shobert, Mishawaka, and Elson B. Fish, Lakeville, both of Ind., assignors to Plas/Steel Products, Inc., Walkerton, Ind.

Division of Ser. No. 835,825, Sep. 22, 1977, Pat. No. 4,154,634. This application Sep. 5, 1978, Ser. No. 939,878

Int. Cl.[3] B29D *3/02*; B29C *1/00*

U.S. Cl. 156—441 **12 Claims**



1. Apparatus for fabricating fiber reinforced plastic rod comprising means for guiding and moving fibrous strands along predetermined paths, means for wetting said strands with liquid heat-hardenable plastic, means for collecting said strands into a compacted bundle as they are being moved, means for fully solidifying the plastic in said bundle by the application of heat thereto; said solidifying means including a unitary elongated peripherally closed, heated hollow die for movably receiving said compacted bundle, said die having an elongated cavity of uniform cross section and a molding surface adapted to be engaged directly by said bundle, said guiding and moving means including mechanism engageable with the solidified bundle for unidirectionally pulling said bundle intermittently through said die in successive steps and for releasing said pull between steps for a predetermined period of dwell time during which said bundle is at rest within said die, said mechanism including adjustable measuring means for controlling the distance said bundle is pulled in said steps and adjustable timing means for controlling the duration of said dwell time, said measuring and timing means being adjustable independently of each other and further operable to maintain such pulling distance and dwell time duration constant once adjusted.

4,249,981

DEVICE FOR FORMING A WEB OF PARALLEL THREADS

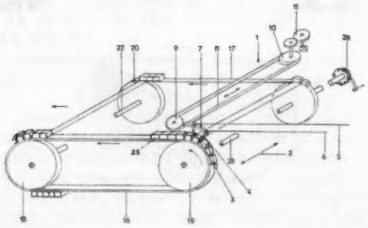
Jacques Pelletier, "Le Tremblay" Albigny-sur-Saone, 69250 Neuville-sur-Saone, and Regis Berliet, 87, Grande Rue de la Croix Rousse, 69004 Lyons, both of France

Filed Dec. 26, 1978, Ser. No. 973,533

Claims priority, application France, Mar. 14, 1978, 78 08065

Int. Cl.[2] D04H *3/04*

U.S. Cl. 156—441 **9 Claims**



1. A device for producing weft webs consisting of parallel spaced threads, said apparatus comprising,

(a) two substantially parallel continuous endless belts separated from one another by a distance equal to the width of the web to be formed;

(b) two rotary drive rollers associateave curved portions as they pass around the drive rollers and rectilinear portions between the drive rollers;

(c) a plurality of blocks mounted on each endless belt so as to be in juxtaposed relation to one another in said rectilinear portions of the belts and spaced apart from one another in the curved portions; and

(d) feed means for feeding at least one weft thread from a fixed source, said feed means comprising at least one reciprocating thread guide having a free end moving on a path transverse to said endless belts and passing alternately between the spaced apart blocks of one belt and the other in the curved portions thereof, said spaced apart blocks with the weft thread fed therebetween advancing with said belts from said curved portions to said rectilinear portions to bring adjacent blocks together whereby said weft threads are gripped therebetween.

4,249,982

APPARATUS FOR MAKING RECLOSABLE BAGS

Steven Ausnit, New York, N.Y., assignor to Minigrip, Inc., Orangeburg, N.Y.

Division of Ser. No. 919,823, Jun. 28, 1978, which is a continuation-in-part of Ser. No. 813,450, Jul. 7, 1977. This application Dec. 10, 1979, Ser. No. 101,780

Int. Cl.³ B32B *31/00*

U.S. Cl. 156—461 **8 Claims**

1. Apparatus for making an integral extruded plastic bag, comprising:

means for forming a thin wall extruded flexible plastic web, and integrally on the plastic web longitudinally extending and laterally spaced complementary resiliently flexible interlocking fastener profiles having an imperforate gusset-forming web area therebetween;

means for collapsably folding the gusset-forming web area into a gusset extending in one direction away from said profiles;

means for folding portions of the plastic web into free terminal digitally manipulatable double thickness bag mouth pull flanges projecting to a suitable length in the opposite direction from said profiles;

means for collapsing the remainder of the plastic web into bag side wall panels toward said gusset and to extend to a substantially greater length than the gusset for providing a substantial bag pouch into which the gusset projects only a limited distance;

and means for securing the fastener profiles together into interlocking but releasable fastener relation;

whereby the gusset provides a secure closure for the bag which closure is adapted to be broken for discharging contents from the bag, and the separable fastener profiles being then adapted for reclosing the bag.

4,249,983

METHOD AND APPARATUS FOR PRODUCTION OF LAMINATED AND SHAPED TRIM PANEL OF CORRUGATED PAPERBOARD BASE

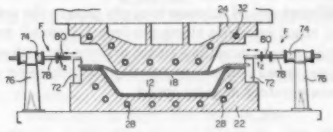
Toshihiko Fujii, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Division of Ser. No. 815,437, Jul. 13, 1977. This application Jul. 11, 1979, Ser. No. 56,593

Claims priority, application Japan, Jul. 14, 1976, 51-84209; Jul. 21, 1976, 51-87070

Int. Cl.³ B29C *17/00*

U.S. Cl. 156—475 **10 Claims**



1. Apparatus for the production of a laminated and shaped trim panel which is composed of a substrate of corrugated paperboard and a skin layer intimately laid on one side of the substrate, the apparatus comprising a hot-press having a stationary die and a movable die;

a substrate feed means for setting a flat substrate of corrugated paperboard in the stationary die; and

a skin material feed means for stretching a sheet material employed as the skin above the stationary die while the movable die is parted from the stationary die, said hot-press being provided with a clearance adjustment mechanism to selectively make the magnitude of clearance between the stationary and movable dies in the engaged state correspond to the thickness of the shaped substrate and the total thickness of the shaped substrate and the skin, said clearance adjustment mechanism comprising a stopper attached to the stationary die to make the clearance correspond to the thickness of the shaped substrate, an actuator having a piston rod and a spacer which has substantially the same thickness as the skin and is fixed to the piston rod, the actuator being positioned such that the spacer is placed on the stopped when the piston rod is extended.

4,249,984

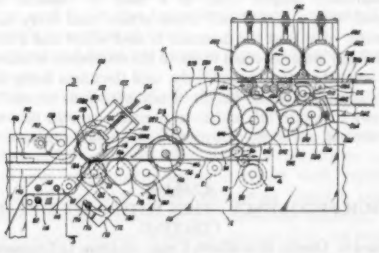
GUMMING APPARATUS

Hubert R. VerMehren, Florissant, Mo., assignor to Ga-Vehren Engineering Company, St. Louis, Mo.

Filed May 24, 1978, Ser. No. 909,064

Int. Cl.³ B32B *31/10, 31/12*

U.S. Cl. 156—552 **12 Claims**



1. A gumming apparatus for use in a business form machine of the type used for processing an elongate web which is separated lengthwise into a plurality of individual sections by transverse separation lines, the apparatus comprising:

(a) support means having a longitudinal axis,

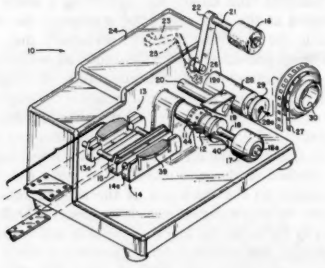
(b) first conveyor means mounted to the support means for conveying the web lengthwise of the support means,
(c) a gum supply,
(d) a gumming cylinder receiving gum from the gum supply, said gumming cylinder being diametrically sized to apply gum to the web at equal intervals along the length of the web, the gumming cylinder having a circumferential length directly related to the length of the individual sections,
(e) mounting means removably mounting the gumming cylinder to the support means transversely of the web for removal of said cylinder and replacement thereof by a cylinder of a different diameter and rotatable about a different axis of rotation to apply gum to the web at different equal intervals along the length thereof, and
(f) drive means including means driving the web at a selected linear speed and means rotating the gumming cylinder at a cooperating angular speed.

4,249,985

PRESSURE ROLLER FOR APPARATUS USEFUL IN REPAIRING SPROCKET HOLES ON STRIP MATERIAL

James S. Stanfield, P.O. Box 1983, Santa Monica, Calif. 90406

Filed Mar. 5, 1979, Ser. No. 17,386
Int. Cl.³ B32B *31/04, 35/00*
U.S. Cl. 156—554 **1 Claim**



1. In apparatus for repairing sprocket holes on a selected section of film by bonding a pressure adhesive repair tape along the length of the film over the sprocket holes, said tape having matching sprocket holes, and said apparatus having a repair station comprised of a wheel on a shaft extending from a support wall, said wheel having sprockets spaced for the sprocket holes of said film, and a pressure roller mounted on a second shaft for pressing film onto the adhesive side of said repair tape for bonding on said film as said sprocket wheel is rotated, an improvement on said pressure roller comprising a cylindrically shaped body of a mass of resilient material formed with a closed cell construction, said body having a diameter of at least the diameter of said wheel and a thickness of resilient material equal to about the difference in diameter of said second shaft and said body, said thickness being substantially greater than the height of said sprockets on said wheel, thereby to assure full and even pressure on said film close in and around each sprocket passing under said pressure roller.

4,249,986

HIGH FREQUENCY HORN WITH SOFT METALLIC COATING

Edward G. Obeda, Brookfield, Conn., assignor to Branson Ultrasonics Corporation, New Canaan, Conn.

Filed Feb. 12, 1980, Ser. No. 120,751
Int. Cl.³ B06B *3/00;* **B23K** *1/06*
U.S. Cl. 156—580.1 **6 Claims**

1. A horn adapted to the resonent along its longitudinal axis when excited with high frequency vibratory energy at an input end and adapted to provide high frequency vibrations to a workpiece at an opposite output end comprising:
an elongated metallic body dimensioned to be resonent as a half wavelength resonator at the frequency of sound travelling longitudinally therethrough;
a soft metallic coating applied to the lateral surface of said body at least in the area where said body may come in contact with an adjacently disposed similar horn or mechanical fixture.

4,249,987

METHOD OF GROWING LARGE PB_{1-x}-SN_x-TE SINGLE CRYSTALS WHERE $0<X<1$

Hiroshi Kimura, Chatsworth, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 486,277, Jul. 8, 1974, abandoned. This application Apr. 22, 1976, Ser. No. 679,270
Int. Cl.³ B01J *17/02*
U.S. Cl. 156—603 **2 Claims**

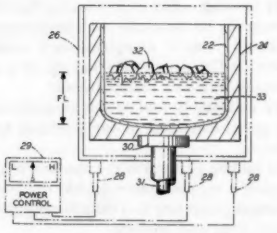
1. A method of growing a large single crystal of $Pb_{1-x}Sn_x$-Te, at near equilibrium conditions where $0<X<1$, from a polycrystalline charge of $Pb_{1-x}Sn_x$-Te comprising;
placing said charge into an opened end container;
positioning said container within a crystal growth ampoule;
evacuating and subsequently sealing said ampoule;
creating a preselected negative thermal gradient at a temperature approximately 50° C. below the melting point of said charge which extends along the vertical axis of said ampoule by placing said ampoule into a furnace, preset to provide such a gradient, maintaining said thermal gradient for a period of from one to four weeks whereby said polycrystalline charge will be converted into a monocrystal, and
allowing said monocrystal to slowly cool to ambient temperatures prior to removing it from said ampoule and said container by removing said ampoule from said furnace.

4,249,988

GROWING CRYSTALS FROM A MELT BY CONTROLLING ADDITIONS OF MATERIAL THERETO

Robert J. Lavigna, Bath, and Raymond E. Reusser, Bethlehem, both of Pa., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Mar. 15, 1978, Ser. No. 886,865
Int. Cl.³ C30B *5/02, 15/04, 29/06*
U.S. Cl. 156—605 **14 Claims**



1. A method of growing a single-crystalline silicon ingot using controlled additions of a first material to a second material, comprising:
heating a plurality of solid particles of the second material under selected ambient conditions in a crucible to partially form them into a liquid, the sizes of the particles being selected so that no more than 60% of the plurality are less than 60 millimeters in cross-sectional dimension to allow space for shifting and settling of the particles within the crucible due to thermal expansion and gravity so that the

crucible is not stressed to a condition of rupture as the particles are heated and partially formed into a liquid;

varying the ambient conditions so that the liquefying process stops when the lower portion of the second material is liquefied but before all of the upper portion of the same material becomes liquefied;

adding at least one solid particle of the first material onto the upper portion of the second material to substantially prevent such solid particle of the first material from contacting the liquid of the second material to prevent such liquid from being scattered;

varying the ambient conditions to liquefy the added first material and the upper portion of the second material to increase the liquid volume; and

contacting a single crystalline seed ingot to the liquid and withdrawing the seed to grow a single crystalline ingot.

4,249,989

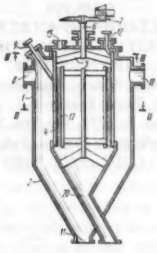
ISOLATING SOLID SUBSTANCES FROM A VAPOR AND GAS MIXTURE AND PULPS

Vladimir N. Kalmykov, ulitsa Lermontova, 2-19; Vitaly A. Musiiko, ulitsa Lermontova, 19, kv. 55; Leonid P. Khlopkov, ulitsa 40 let Sovetskoi Ukrainy, 24-11; Stanislav I. Gashenko, ulitsa Gorkogo, 159, kv. 76; Alexandr A. Rogatkin, ulitsa 40 let Sovetskoi Ukrainy, 76, kv. 3; Grigory I. Silakov, ulitsa Yatsenko, 4a, kv. 59, all of Zaporozhie, U.S.S.R.; Viktor F. Shipilov, deceased, late of Zaporozhie, U.S.S.R.; by Elena S. Skibina, administrator, prospekt Lenina, 200, kv. 7, Zaporozhie, U.S.S.R.; by Gennady V. Shipilov, administrator, prospekt Lenina, 200, kv. 7, Zaporozhie, U.S.S.R., and by Fedor D. Shipilov, administrator, prospekt Lenina, 200, kv. 7, Zaporozhie, U.S.S.R.

Filed Sep. 24, 1979, Ser. No. 78,038

Int. Cl.[3] B01D *1/24*

U.S. Cl. 159—10 **5 Claims**



1. A condenser for isolating solid substances from vapor and gas mixture and pulps in the production of rare-earth metals by chlorination, comprising: a vertical cylindrical casing having a conical bottom; two internal vertical extending protrusions on the walls of said cylindrical casing in a spaced relationship with respect to said bottom thereof; a vertical rotary drum accommodated in said casing and adjoining said protrusions with the other periphery thereof so that said protrusions and rotary drum define a vertical transversal partition wall which is in a spaced relationship with respect to said casing bottom, the interior of said casing defining a U-shaped space; a pipe for admission of a vapor and gas mixture provided in the upper portion of one inlet branch of said U-shaped space; a pipe for admission of a pulp provided in the upper portion of said inlet branch of the U-shaped space and directed towards the outer periphery of said drum; a pipe for discharge of the vapor and gas mixture cleaned from solid substances provided in the upper portion of the other outlet branch of said U-shaped space; a pipe for removal of solid substances provided in the lower portion of said conical bottom; a pipe for feeding a pulp containing rare-earth metals to the inner walls of the said drum; a device for distributing the pulp being fed over the inner walls of the said drum and for cleaning them; a pipe for removal of solid substances from the lower portion of said drum; and means for removing vapors from said drum.

4,249,990

PROCESS FOR REMOVAL OF POTASSIUM VALUES FROM PULP MILL LIQUORS

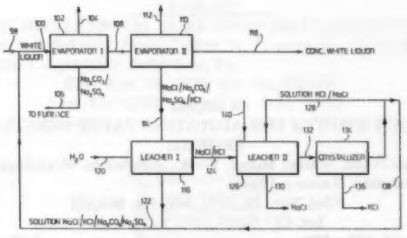
Allan F. Gilbert, Thunder Bay, and W. Howard Rapson, Scarborough, both of Canada, assignors to ERCO Envirotech Ltd., Islington, Canada

Filed Apr. 2, 1979, Ser. No. 26,204

Claims priority, application United Kingdom, Apr. 19, 1978, 15412/78

Int. Cl.[3] D21C *11/04*

U.S. Cl. 162—17 **27 Claims**



1. A continuous process of pulping cellulosic fibrous material including the steps of:

contacting said cellulosic fibrous material with a pulping liquor containing sodium hydroxide as at least one active pulping chemical,

separating the pulped material from spent pulping liquor,

subjecting said spent pulping liquor to a recovery and regeneration operation including a furnacing step and a causticization step to form a white liquor containing sodium hydroxide, sodium sulphate, sodium chloride and potassium values, said white liquor having a potassium molar ratio (K/K+Na) in the region of 0.14 to 0.25,

evaporating said white liquor by boiling the same at a temperature of about 50° to about 120° C. to deposit a mixture containing sodium carbonate and sodium sulphate therefrom until the mother liquor is substantially saturated with respect to sodium chloride,

separating said deposited mixture from the resulting mother liquor,

recycling at least part of said deposited mixture to said furnacing step,

evaporating said mother liquor by boiling at a temperature of about 80° to about 110° C. to deposit therefrom sodium chloride substantially uncontaminated with potassium chloride until said evaporated mother liquor is substantially saturated with respect to potassium chloride,

separating said deposited sodium chloride from the resulting concentrated white liquor,

evaporating said concentrated white liquor by boiling at a temperature of about 40° to about 80° C. to deposit potassium chloride therefrom, and

separating the deposited potassium chloride from the resulting mother liquor.

4,249,991

COMPOSITION OF A MATERIAL BASED ON MINERAL FIBERS

Emile Baes, Kapelle op den Bos; Jean-Pierre Navez, Gent, and Marc Della Faille de Leverghem, Florree, all of Belgium, assignors to S.A. Redco, Brussels, Belgium

Filed Jul. 3, 1978, Ser. No. 921,196
Claims priority, application France, Jul. 8, 1977, 77 21059
Int. Cl.[3] C08L *3/01;* C04B *43/02;* D21H *5/18*
U.S. Cl. 162—152 14 Claims

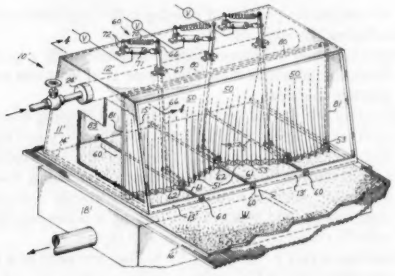
1. A composition based on mineral fibers free of asbestos, for use as a suspension in water to form a felt or board after filtering and drying, which consists essentially of at least 5 to 95% by weight of an inorganic fibrous material based on silica or silicates, which is a member selected from the group consisting of ceramic fibers, glass wool, rock wool and mixtures thereof, 10–70% by weight of Kaolin or Kaolinite clay, an organic binder, the proportion of organic substance being not greater than 8% of the total weight of dry substances of the composition, said organic binder containing at least 0.5% of soluble starch, and 10-60% of a mineral having a needle-like crystal structure which is wollastonite or mica.

4,249,992

STEAM SHOWER FOR ADJUSTING PAPER MOISTURE PROFILE

Roger Wells, Mercer Island, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Nov. 29, 1978, Ser. No. 964,322
Int. Cl.[3] D21F *1/80, 5/14, 5/18*
U.S. Cl. 162—198 3 Claims



3. An improved method for controlling the moisture profile of a paper web across its width wherein said web traveling on a paper machine is contacted with a blanket of steam extending across the width of the machine as said web passes over a suction box, the improvement, comprising:

sensing the average content of the web at incremental widths across the width of the web; and

adjusting the dimensions of the steam blanket in the machine direction within each incremental width in response to the sensed moisture of that increment across the entire width of the web,

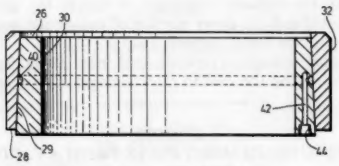
as a result of the adjusting the dimensions of each compartment the amount of steam absorbed by the portion of the web adjacent each incremental width changes resulting in a corresponding change in dewatering of said web portion by said suction box, thereby controlling the ultimate moisture profile of said paper web.

4,249,993

ADJUSTABLE BEARING SYSTEM FOR PAPER MACHINE

Wilhelmus J. Stegelitz, Charlotte, N.C., and George P. Bernreiter, Dollard des Ormeaux, Canada, assignors to Dominion Engineering Works Limited, Lachine, Canada

Filed May 30, 1979, Ser. No. 43,753
Claims priority, application Canada, Jun. 23, 1978, 306098
Int. Cl.[3] D21F *7/02*
U.S. Cl. 162—381 3 Claims



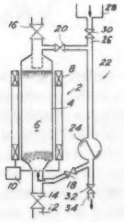
1. In a paper machine having a first gear, a second gear rotatably mounted in meshing relation therewith, including bearing means supporting the second gear for rotation therebetween, the improvement comprising a pair of complementary eccentric rings in supporting relation with a said bearing to permit orbital repositioning of said bearing by relative rotation of one ring relative to the other, said eccentric rings having an axially tapering, separable interface therebetween, to provide a tight fit of said bearing in repositionable relation in said housing, and hydraulic jacking means for connection with a fluid pressure source, in use, for freeing said rings off said tapering interface.

4,249,994

METHOD FOR UNCLOGGING AN ELECTROMAGNETIC FILTER AND AN INSTALLATION FOR CARRYING OUT SAID METHOD

Lucien Dolle, Palaiseau, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 8, 1977, Ser. No. 766,675
Claims priority, application France, Feb. 19, 1976, 76 04646
Int. Cl.[3] G21C *19/32;* B10D *35/06*
U.S. Cl. 176—37 1 Claim



1. A method for cleaning an electro-magnetic filter containing a magnetizable packing located in a water circulatory loop of a nuclear reactor by subjecting the packing to a series of washing and draining cycles of wash water withdrawn from said circulatory loop, said method comprising the steps of:

(a) isolating the filter from the water circulatory loop of the reactor and draining the water so as to empty the filter which contains then only steam;

(b) withdrawing a fraction of the water being circulated in the isolated circulatory loop for use as wash water for said filter;

(c) introducing said wash water into said filter at a temperature within the range of 200° C. to 300° C. and at a pres-

sure within the range of 100 to 160 bar so that a sudden expansion of said water occurs in the filter;

(d) completely draining the wash water introduced into the filter through a bottom portion of the filter, so as to empty the filter which contains then only steam;

(e) repeating the withdrawing, introducing and draining steps several times in succession so as to subject the packing of said filter to a series of washing and draining cycles in order to completely clean said filter.

4,249,995

LIQUID-METAL COOLED REACTOR WITH PRACTICALLY STATIC INTERMEDIATE ZONE

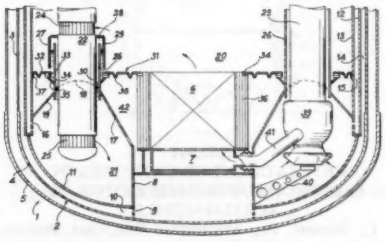
Patrick Jogand, Aix en Provence, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Jun. 23, 1978, Ser. No. 918,368

Claims priority, application France, Jul. 4, 1977, 77 20488; Jun. 5, 1978, 78 16713

Int. Cl.³ G21C *19/28*

U.S. Cl. 176—65 **9 Claims**



1. A liquid-metal cooled nuclear reactor comprising an open-topped main vessel having a vertical axis and containing liquid metal, a reactor core, an inner vessel mounted and coaxial within the main vessel, and an inner vessel extension in the form of a transverse skew wall provided with a downwardly-bent edge joined to a structure connected to said main vessel, said skew wall being transversed by cylindrical sleeves providing a leak-tight passage for the bodies of pumps and heat exchangers disposed at intervals around the reactor core, a baffle extending above said skew wall and delimiting therewith a space containing a practically static volume of liquid metal which forms a thermal screen between hot liquid metal located within the inner vessel above said baffle and cold liquid metal located between the inner vessel and the main vessel beneath said skew wall.

4,249,996

ELECTRICALLY HEATED BY-PRODUCT COKE OVEN

John J. Kelmar, 2205 Cypress Dr., McKeesport, Pa. 15131

Filed Jun. 12, 1979, Ser. No. 47,876

Int. Cl.³ C10B *5/00, 19/00*

U.S. Cl. 202—133 **4 Claims**

1. A high temperature by-product coke oven comprising a refractory enclosure having walls forming a coking chamber provided at its top with a normally closed coal-charging opening and with an outlet for volatile by-products produced in a coking operation, a high-temperature resistant metal sole plate forming the bottom of said chamber near the bottom wall of said enclosure but spaced therefrom, and electrical resistance elements sealed in the space between said plate and the bottom wall of the enclosure for heating the plate directly to coke coal supported by the plate, said enclosure having normally closed openings at opposite ends of said chamber directly above said

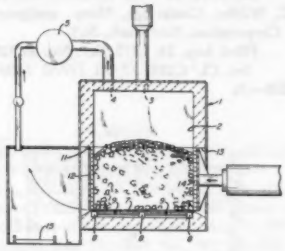


plate adapted to be opened to permit coke to be pushed out of the oven.

4,249,997

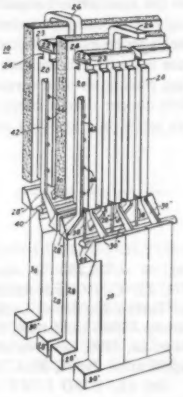
LOW DIFFERENTIAL COKE OVEN HEATING SYSTEM

Norbert J. Schmitz, North Collins, N.Y., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Dec. 18, 1978, Ser. No. 970,597

Int. Cl.³ C10B *1/06, 5/04, 5/12, 21/06*

U.S. Cl. 202—142 **3 Claims**

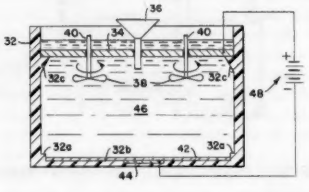


1. In a regenerative coke oven battery heated with rich gas or lean gas having a plurality of horizontal coking chambers and between each coking chamber a heating wall containing a plurality of vertical heating flues and including regenerators which communicate via duct work with the heating flues and also with waste gas exhaust means and lean gas and air sources, the improvement comprising said vertical heating flues defined by header walls provided with header ducts and multilevel outlet slots connecting the header ducts and the heating flues, a plurality of horizontal bus channels, each channel located above and communicating with a group of adjacent vertical heating flues, and a plurality of cross-over ducts each connecting the horizontal bus channel of a first group of adjacent flues with the horizontal bus channel of a second group of adjacent flues which second group is located on the opposite side of a coking chamber from the first group whereby a coke cake produced in this regenerative coke oven battery has a low vertical temperature differential.

4,249,998
APPARATUS AND PROCESS FOR PRODUCING COPPER-BORON CARBIDE COMPOSITE BY ELECTROLYTIC ENTRAPMENT

Thomas C. Wilder, Cambridge, Mass., assignor to Kennecott Copper Corporation, New York, N.Y.

Filed Aug. 24, 1979, Ser. No. 69,526
Int. Cl.³ C25D *15/00, 17/10, 1/00*
U.S. Cl. 204—16 **19 Claims**

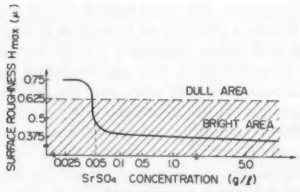


1. An apparatus for producing a composite boron carbide-filled copper layer, comprising:
a cell containing an electrolyte with copper ions;
a copper anode;
support means for positioning a substrate below said anode in contact with said electrolyte;
means for introducing electrically nonconductive particles of boron carbide into the electrolyte between said anode and a substrate, said means for introducing including an opening in the anode through which particles can be introduced into the electrolyte beneath said anode;
means for uniformly distributing particles in said electrolyte to enable particles to be evenly deposited on a substrate when a substrate is positioned beneath said anode; and
means for applying plating voltage across said anode and a substrate to plate copper onto a substrate so as to entrap particles as they settle, in a growing copper matrix.

4,249,999
ELECTROLYTIC ZINC-NICKEL ALLOY PLATING

Tetsuaki Tsuda, and Tatsuo Kurimoto, both of Osaka, Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Mar. 13, 1980, Ser. No. 130,184
Claims priority, application Japan, Mar. 30, 1979, 54-39190
Int. Cl.³ C25D *3/56*
U.S. Cl. 204—28 **2 Claims**



1. A method of electrolytically plating a steel strip with a Zn-Ni alloy in an electrolyte bath containing Zn^{2+} ions in an amount of 10–130 g/l, Ni^{2+} ions in an amount of 20–140 g/l at a current density of 4.0–70 A/dm², at a temperature of 40°–70° C. at a pH of 1.0–4.5, characterized by adding a strontium compound in an amount of 0.05–10 g/l, calculated as $SrSO_4$, to the electrolyte.

4,250,000
ELECTROCHEMICAL PROCESS FOR METAL ALKOXIDES

Mark A. Kuck, Upper Montclair, N.J.; Gary K. Miller, Port Chester, and Miguel Coll-Palagos, Rye, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

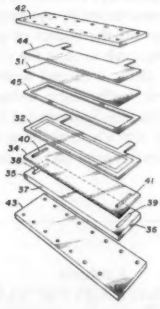
Filed Mar. 26, 1979, Ser. No. 23,937
Int. Cl.³ C25B *3/12*
U.S. Cl. 204—59 QM **8 Claims**

1. In a process for the electrochemical preparation of metal alkoxides by passing a direct current between an anode of a metal selected from the group consisting of metals which have a standard electrode potential on the electromotive series between about minus 0.20 volts and about minus 1.68 volts and an indifferent cathode through an anhydrous electrolyte containing an alcohol having one or two hydroxy groups and a conducting salt the improvement which comprises utilizing as an electrolytic separator between anolyte and catholyte an anion-exchange membrane having a permselectivity for anions of at least 70 percent whereby the metal alkoxide is formed in the anolyte.

4,250,001
PRETREATMENT OF CATHODES IN ELECTROHYDRODIMERIZATION OF ACRYLONITRILE

Joseph C. Burnett, Jr., Manchester, Mo., and William A. Heckle, Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Filed Jun. 19, 1979, Ser. No. 50,266
Int. Cl.³ C25B *3/10, 11/00*
U.S. Cl. 204—73 A **5 Claims**



1. In a process for the production of adiponitrile from acrylonitrile by electrolytic dimerization in an electrolytic cell containing a dimerization electrolyte and electrodes comprising carbon steel anodes, and cathodes, at least a portion of which cathodes are metal plated, and which cathodes, after prolonged exposure to the dimerization electrolyte during the electrolyte dimerization process, become fouled, and where such fouling interfers with the electrolytic dimerization, the improvement comprising pretreating before dimerization the plated cathode by wetting the surface of the cathode with an aqueous phosphoric acid solution containing potassium iodide.

4,250,002

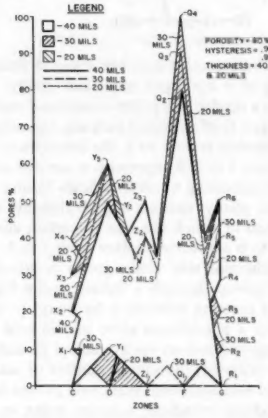
POLYMERIC MICROPOROUS SEPARATORS FOR USE IN ELECTROLYTIC PROCESSES AND DEVICES

Christine A. Lazarz; Edward H. Cook, Jr., both of Niagara Falls, and Arthur C. Schulz, North Tonawanda, all of N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 957,515, Nov. 3, 1978, abandoned. This application Sep. 19, 1979, Ser. No. 76,884

Int. Cl.[3] C25B *1/34, 13/02, 13/08*

U.S. Cl. 204—98 32 Claims



1. A polymeric microporous electrolytic cell separator having:

a. porosity of at least about 60%;

b. thickness of between 8 and 130 mils;

c. hysteresis of from 0.30 to 0.99 wherein hysteresis is defined as the ratio of the amount of mercury trapped within the pore structure of the separator after release of pressure to 1 psi compared to the amount of mercury present when first subjected to total impregnation by mercury at 50,000 psi, and

d. distribution of pore sizes in a range between 0.004 and 34 microns wherein at least 85% of said pores have a diameter of between 0.12 and 33 microns and at least 60% of said pores have a diameter between 0.59 and 33 microns;

wherein said porosity, thickness, hysteresis, and pore size distribution are adapted to provide said separator with the porperty of exhibiting a high current efficiency including the property of a current efficiency of about 85% to about 98% when measured in a chlor-alkali cell at a sodium hydroxide concentration of 150 gpl, and said separator having hydraulic properties adapted for use in a commercial scale cell.

4,250,003

PROCESS FOR THE ELECTROLYTIC PREPARATION OF ALKALI METAL CHLORATES

Roger Charvin, St. Jean De Maurienne, and Jean-Louis Pignan, Grenoble, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Filed Nov. 5, 1979, Ser. No. 91,141

Claims priority, application France, Nov. 14, 1978, 78 32089

Int. Cl.[3] C25B *1/14, 1/26*

U.S. Cl. 204—098 3 Claims

1. Improvement in processes for manufacture of alkali metal chlorates by electrolysis of alkali metal chlorides in which the electrolysis solution contains cation impurities which comprises reducing the normal temperature range of about 55° to 85° C., a quantity between about 30° C. and 50° C., while continuing the electrolysis reaction when the voltage reaches an undesirable level to reduce the voltage required during normal operation and then reestablishing the normal operating conditions of the electrolysis.

4,250,004

PROCESS FOR THE PREPARATION OF LOW OVERVOLTAGE ELECTRODES

Ronald C. Miles, and Larry D. Carpenter, both of Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 63,016, Aug. 2, 1979. This application Feb. 25, 1980, Ser. No. 124,510

Int. Cl.[3] C25B *1/16, 1/26, 11/02, 11/03*

U.S. Cl. 204—98 44 Claims

1. In a process for preparing an electrode having reduced cathodic hydrogen overvoltage potential in an electrolytic cell, wherein both a low overvoltage metal and a sacrificial metal are electrodeposited onto an electrically conductive substrate by insertion of said electrically conductive substrate into an electroplating solution along with a plating anode, and an electric current is passed between said plating anode and said electrically conductive substrate and the sacrificial metal is removed by contacting with alkali metal hydroxide, the improvement which comprises:

(a) initiating electrodeposition at a first current density, CD_1,

(b) after a first time interval, t_1, adding a sacrificial metal to said electroplating solution, and

(c) after a second time interval, t_2, changing said first current density, CD_1, to a second current density, CD_2.

4,250,005

RADIATION CROSS-LINKED POLYURETHANE FOAMS

Roland J. Lamplugh, Chester, Pa., assignor to Scott Paper Company, Philadelphia, Pa.

Continuation of Ser. No. 404,812, Oct. 9, 1973, abandoned, which is a division of Ser. No. 258,488, Jun. 1, 1972, abandoned. This application Aug. 20, 1976, Ser. No. 716,081

Int. Cl.[3] C08G *18/04;* C08J *7/18*

U.S. Cl. 204—159.15 10 Claims

1. A method of preparing a polyurethane foam having modified properties which comprises

(a) incorporating in the foam-forming composition employed to produce said foam and comprising a polyol selected from the group consisting of polyester polyols, polyether polyols having a molecular weight of about 1500 or less and mixtures of polyester polyols and polyether polyols wherein the polyester polyol has a molecular weight of from about 400 to about 5000 and the polyether polyol has a molecular weight of from about 250 to about 6500 and an organic polyisocyanate, at least one cross-link promoter selected from the group consisting of polyfunctional, polyunsaturated acrylates; polyfunctional, polyunsaturated methacrylates; triallyl cyanurate; methyl methacrylates; 1,5--cyclooctadiene; and bis (β-chloroethyl) vinyl phosphonate,

(b) allowing the composition to foam, and

(c) subjecting said foam to ionizing radiation at a dosage sufficient to modify the properties of said foam.

4,250,006

POLYMERIZABLE COATING COMPOSITION CONTAINING POLYMERIZABLE EPOXIDE COMPOUND AND VINYL CHLORIDE DISPERSION POLYMER AND METHOD OF COATING UTILIZING SAME AND COATED ARTICLES PRODUCED THEREBY

Joseph M. Guarnery, Libertyville, and Dennis E. Kester, Crystal Lake, both of Ill., assignors to American Can Company, Greenwich, Conn.

Filed Mar. 19, 1979, Ser. No. 21,914

Int. Cl.[3] **C08L** *27/22;* **C08J** *7/10*

U.S. Cl. 204—159.18 **20 Claims**

1. A polymerizable coating composition consisting essentially of:

A. 35–80 parts of an epoxidic prepolymer material including not more than about 15 percent by weight of cycloaliphatic epoxide compounds;

B. 20–65 parts of a vinyl chloride dispersion polymer having a high molecular weight represented by inherent viscosity of 0.60–1.60 as determined by the method of ASTM D1243-66 and a particle size of 0.5–20.0 microns, the particles of said vinyl chloride polymer being dispersible in said epoxidic prepolymer material and being wettable thereby but substantially insoluble therein;

C. 0.5–10.0 percent by weight of said epoxidic prepolymer material of an onium salt photoinitiator which decomposes upon exposure to electromagnetic radiation to initiate polymerization of said epoxidic prepolymer material; and,

D. as optional additives, pigments, dyes, fillers and processing aids,

said composition being substantially free from diluent compounds which would substantially solvate the vinyl chloride polymer and containing not more than about 10 percent, based upon the weight of the vinyl chloride polymer, of a plasticizer therefor.

4,250,007

PHOTOCURABLE ACRYLIC PHOSPHATE ESTERS OF EPOXIDIZED POLYBUTADIENE

Hiroshi Yasuno; Toshimune Yoshinaga, both of Ichihara, and Tsunetomo Nakano, Chiba, all of Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Mar. 14, 1979, Ser. No. 20,496

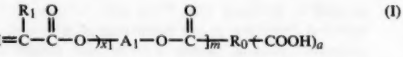
Claims priority, application Japan, Mar. 17, 1978, 53-29838

Int. Cl.[3] **C08F** *230/02, 279/02;* **C08J** *3/28*

U.S. Cl. 204—159.23 **12 Claims**

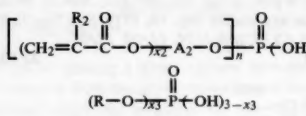
1. A photosetting composition comprising:

(A) 100 parts by weight of a modified, epoxidized butadiene polymer which comprises (1) a backbone group consisting of a residue of an epoxidized butadiene polymer, (2) 5 to 50 side chain groups per 100 butadiene units in said backbone group, each of which side chain group comprises a residue of a member selected from acid aromatic and cycloaliphatic polybasic carboxylic ester compounds of the formula (I):



(I)

wherein R_1 represents a member selected from the group consisting of a hydrogen atom and a methyl radical, A_1 represents a residue of a polyol compound exclusive of the number (x_1+1) of hydroxyl radicals, R_o represents a residue of a member selected from the group consisting of aromatic and cycloaliphatic polybasic carboxylic acids, which residue is exclusive of the number $(m+a)$ of carboxyl radicals, the subscript x_1 is a positive number from 1 to 3, the subscript m is a positive number from 1 to 3 and the subscript a is a positive number from 1 to 3, and each of which side chain groups is attached to said backbone group through a linking group formed by an esterifying reaction between a carboxylic acid radical in said polybasic carboxylic ester and an epoxy radical in said epoxidized butadiene polymer, and (3) 5 to 50 additional side chain groups per 100 butadiene units in said backbone group, each of which additional side chain groups comprises a residue of an acid phosphoric ester compound of the formulae (II) and (III):



(II)

(III)

wherein R_2 represents a member selected from the group consisting of a hydrogen atom and methyl radical, A_2 represents a residue of a polyol compound exclusive of the number (x_2+1) of hydroxyl radicals, the subscript x_2 is a positive number from 1 to 3, the subscript n is a positive number from 1 to 2, R represents a member selected from the group consisting of alkyl radicals having 1 to 15 carbon atoms, phenyl radicals and alkylphenyl radicals, the alkyl radical of which has 1 to 15 carbon atoms, and the subscript x_3 is a positive number from 1 to 2, and each of which additional side chain group is attached to said backbone group through a linking group formed by an esterifying reaction between a hydroxyl (—OH) radical attached to a phosphorus atom in said acid phosphoric ester compound and an epoxy radical in said epoxidized butadiene polymer, the sum in number of said side chain groups and said additional side chain groups in said modified epoxidized butadiene polymer being in a range of from 10 to 60 per 100 butadiene units;

(B) 30 to 800 parts by weight of at least one photopolymerizable monomer, and;

(C) 0.5 to 15 parts by weight of a photosensitizer.

4,250,008

PURIFICATION OF FACTOR VIII

Patrick Mattock, Botley, England, assignor to United Kingdom Atomic Energy Authority, London, England

PCT No. PCT/GB78/00038, § 371 Date Jun. 22, 1979, § 102(e) Date Jun. 22, 1979, PCT Pub. No. WO79/00299, PCT Pub. Date May 31, 1979

This PCT application filed Jun. 22, 1979, Ser. No. 112,633

Claims priority, application United Kingdom, Nov. 17, 1977, 47933/77

Int. Cl.[3] **G01N** *27/26;* **A61K** *35/14, 35/16*

U.S. Cl. 204—180 R **8 Claims**

1. A method of purifying a Factor VIII containing aqueous solution characterised by the steps of

(i) reducing the ionic strength of the solution to a level such that it is capable of being electrophoresed;

(ii) adjusting the pH of the solution to within a range where the stability of Factor VIII is not adversely affected;

(iii) subjecting the product of step (ii) to continuous flow electrophoresis by injecting the solution, as a migrant solution, into a second aqueous solution, laminarly flowing in an annular separation chamber as a carrier solution for the migrant solution and stabilised by means of an angular velocity gradient, and applying a constant electric field across the resulting mixture to produce a differential movement of the Factor VIII component of the migrant solution with respect to the other major components of the solution perpendicular to the direction of flow of the layer; and

(iv) collecting the separated Factor VIII component.

4,250,009

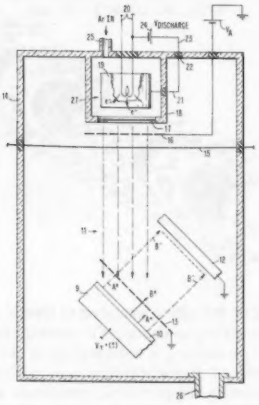
ENERGETIC PARTICLE BEAM DEPOSITION SYSTEM

Jerome J. Cuomo, Lincolndale; Richard J. Gambino, Yorktown Heights; James M. Harper, Yorktown Heights, and John D. Kupstis, Yorktown Heights, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 18, 1979, Ser. No. 40,339

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 N **13 Claims**



1. A method for use of an energetic particle beam directed at a target for selective ejection of ions of a plurality of elements from a target forming both positive and negative ions towards a substrate comprising the steps of:

bombarding said target with an energetic particle beam, said target including a plurality of elements adapted for forming both positive and negative ions ejected therefrom; applying a potential difference between said target and said substrate for attracting ions ejected from said target by said energetic particle beam to said substrate;

adjusting the potential difference between said target and said substrate to direct predetermined proportions of positive and negative ions to said substrate as a function of said potential difference with variations of said difference and said elements are deposited selectively upon said substrate as a function of said potential difference.

4,250,010

INTEGRATED ION SELECTION ELECTRODE DEVICE

Asaji Kondo; Masao Kitajima, and Isamu Hatanaka, all of Asaka, Japan, assignors to Fuji Photo Film Corporation, Minami-ashigara, Japan

Filed Oct. 24, 1979, Ser. No. 87,855

Claims priority, application Japan, Oct. 27, 1978, 53-148087[U]

Int. Cl.³ G01N *27/30*

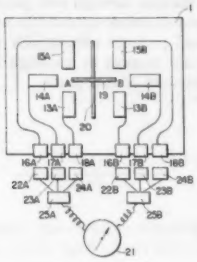
U.S. Cl. 204—195 M **3 Claims**

1. An ion selection electrode device comprising:

a supporting board having an electrically insulating surface;

a plurality of pairs of electrodes, each of said pairs being arranged on said supporting board, a first electrode of each of said pairs of electrodes having a head thereof positioned within a first circle and a second electrode of each of said pairs of electrodes having a head thereof positioned within a second circle, each of said electrodes comprising, in order, a metal substrate laminated with a layer of a non-water-soluble salt of said metal, an electrolytic layer containing anions in common with said non-water-soluble salt, and an ion selection membrane, each electrode of said pairs of electrodes having a like ion selection membrane and the ion selection membranes being different between at least some of said pairs of electrodes;

a non-water-permeable and electrically insulating membrane



covering each of said electrodes with only said ion selection membranes exposed;

an insulating ridge positioned between said two circles; and

a bridge of porous material extending over said ridge.

4,250,011

ELECTRODE TOOL FOR ELECTROCHEMICAL MACHINING

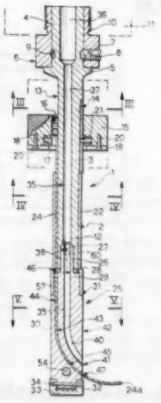
Giuseppe Capello, Turin; Vittorio Giordano, Vigone, and Renato Biondi, Moncalieri, all of Italy, assignors to Centro Ricerche Fiat S.p.A., Orbassano, Italy

Filed Sep. 17, 1979, Ser. No. 76,005

Claims priority, application Italy, Oct. 30, 1978, 69489 A/78

Int. Cl.³ B23P *1/02;* **C25D** *17/10*

U.S. Cl. 204—224 M **9 Claims**



1. An electrode tool for electrochemical machining comprising:

an elongate support shaft; connector means on one end of said shaft for connection to a machine tool mandrel;

an electrode guide head releasably connected at one end thereof to the free end of said shaft;

means defining a conduit extending substantially axially through said support shaft, said conduit having an inlet at said one end of said support shaft adapted for connection to a fluid supply means and an outlet adjacent the other end of said support shaft;

an elongate, flexible electrode carried on said support shaft for axial sliding relative thereto, said electrode extending substantially parallel to said conduit; and

means for regulating the axial position of said electrode

relative to said support shaft, said means carrying said electrode on said support shaft; and

said electrode guide head defining a curved guide therein having an opening adjacent said conduit outlet, said electrode being slidable through said guide such that an end portion of said electrode extends through said opening of said guide and projects substantially radially relative to the axis of said support by an angle determined by the radius of curvature of said guide.

4,250,012

SYSTEM OF CURRENT SUPPLY BUSES FOR ALUMINUM-PRODUCING ELECTROLYZERS

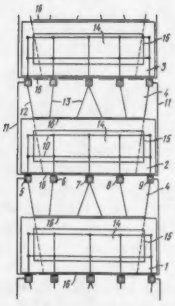
Nikolai A. Kaluzhsky, Vasilievsky Ostrov, Sredny prospekt, 6, kv. 23; Semen E. Gefter, ulitsa Chaikovskogo, 18, kv. 6; Igor K. Tsybukov, Tikhoretsky prospekt, 9, korpus 10, kv. 16; Svetozar V. Evdokimov, Lesnoi prospekt, 13/8, kv. 5; Alexei S. Derkach, Detskaya ulitsa, 63, korpus 5, kv. 46; Anatoly M. Tsyplakov, prospekt Kima, 30, kv. 74; Valery P. Lankin, prospekt Nauki, 45, korpus 2, kv. 58; Boris P. Velichko, Nalichnaya, 21, kv. 48, all of Leningrad; Albert A. Kostin, ulitsa Glagoleva, 19, kv. 132, Moscow; Grigory E. Volfson, Budapeshtskaya ulitsa, 10, korpus 2, kv. 101, and Vladimir P. Nikiforov, Nalichnaya ulitsa, 49, kv. 8, both of Leningrad, all of U.S.S.R.

Filed Feb. 1, 1979, Ser. No. 8,382

Claims priority, application U.S.S.R., Feb. 6, 1978, 2578511

Int. Cl.[3] C25C *3/16*

U.S. Cl. 204—243 M **4 Claims**



1. A system of current supply buses for aluminum-producing electrolyzers arranged transversely in a row in spaced relation with each other, said system having a plurality of cathode stacks and a plurality of anode risers in each space between next-adjacent electrolyzers, anode systems and anode buses electrically connected to the anode risers for supplying current from said anode risers to said anode systems, each of said anode systems being shaped as a parallelogram with a first pair of spaced parallel border edges and a second pair of spaced parallel border edges transverse to the first pair of edges,

at least two anode risers of each of said electrolyzers being positioned beyond planes passing through the second pair of edges of said anode systems and outside the area bounded by said planes, the proportion of said anode risers positioned beyond said planes relative to the total number of said anode risers being selectec to insure symmetric distribution of the magnetic field intensity.

4,250,013

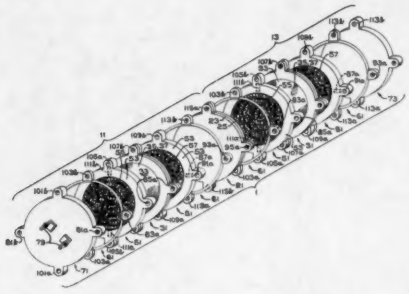
METHOD OF DEPOSITING A CATALYST TO FORM A SOLID POLYMER ELECTROLYTE MEMBRANE

William W. Carlin, Portland, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 23, 1979, Ser. No. 15,529

Int. Cl.[3] C25B *11/06, 11/08, 13/08, 11/03*

U.S. Cl. 204—282 **4 Claims**



1. A method of depositing a catalyst to form a solid polymer electrolyte comprising contacting a permionic membrane with a first solution comprising a reducing agent chosen from the group consisting of hypophosphites and borohydrides, and thereafter contacting the permionic membrane with a second solution comprising salts of metals more and less leachable to be deposited on the permionic membrane, a complexing agent, and a buffer; codepositing a more leachable and a less leachable transition metal on the permionic membrane and leaching out the more leachable transition metal.

4,250,014

COAL LIQUEFACTION PROCESS

Robert B. Long, Atlantic Highlands; Martin L. Gorbaty, Westfield, both of N.J., and Lonnie W. Vernon, Baytown, Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 21, 1978, Ser. No. 935,568

Int. Cl.[3] C10G *1/00, 1/06;* C10B *57/08, 53/00*

U.S. Cl. 208—8 LE **11 Claims**

1. In a coal liquefaction process wherein the particulate coal is converted to a hydrocarbonaceous oil in the presence of a liquid phase solvent, in a coal liquefaction zone, at coal liquefaction conditions, the improvement which comprises:

(a) contacting said particulate coal with a vapor phase hydrogen donor solvent at a temperature ranging from about 150° to about 350° C. and at a pressure ranging from about 0 to about 150 psig, for a time sufficient for said coal to sorb at least a portion of said vapor phase solvent and thereby swell, and increase in weight by at least about 3 weight percent, and

(b) subsequently subjecting the resulting swollen coal to said coal liquefaction conditions.

4,250,015

MECHANOCHEMICAL HYDROGENATION OF COAL

Ralph T. Yang, Tonawanda; Robert Smol, East Patchogue; Gerald Farber, Elmont, all of N.Y., and Leonard M. Naphtali, Washington, D.C., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 18, 1978, Ser. No. 970,841

Int. Cl.[3] C10G *1/08;* C10B *53/08, 21/00, 1/06*

U.S. Cl. 208—10 **11 Claims**

1. A method for the hydrogenation of coal comprising applying a force to coal particulates to reduce the size of the

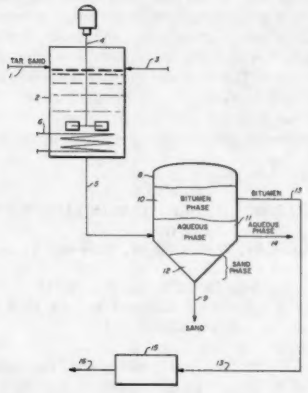
particulate coal in contact with elemental tin catalyst and a hydrogen donor to form hydrocarbons.

4,250,016

RECOVERY OF BITUMEN FROM TAR SAND

John H. Estes, Wappingers Falls, and Ernest P. Buinicky, Newburch, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 20, 1978, Ser. No. 962,277
Int. Cl.[3] C10G *1/04, 29/08*
U.S. Cl. 208—11 LE **9 Claims**



1. A process for recovering bitumen from a tar sand comprising bitumen in admixture with sand grains; which process comprises:

(a) mixing in a mixing zone, said tar sand with an aqueous solution of an ammonium salt selected from the group consisting of ammonium sulfite, ammonium bisulfite, and mixtures thereof under conditions of agitation sufficient for contacting said sand grains with said aqueous solution, at a temperature in the range of about 120° F. to about 260° F., for forming a tar sand-aqueous solution mixture;

(b) separating, in a separation zone, said tar sand-aqueous solution mixture, at an elevated temperature sufficient to reduce the density of bitumen to a value lower than the density of said aqueous solution, into a bitumen phase, an aqueous solution phase, and a sand phase; and

(c) recovering said bitumen phase substantially free of said aqueous phase and said sand phase.

4,250,017

PROCESS AND APPARATUS FOR SEPARATING TAR FROM A TAR SAND MIXTURE

Lucio V. Reale, 1827 - 46 St. SE., Calgary, Alberta T2B 2J9, Canada

Continuation-in-part of Ser. No. 959,594, Nov. 13, 1977, abandoned. This application Oct. 12, 1979, Ser. No. 84,063
Claims priority, application Canada, Dec. 12, 1977, 272879
Int. Cl.[3] B01D *12/00;* C10G *1/04*
U.S. Cl. 208—11 LE **32 Claims**

1. A process for separating tar from a tar sand mixture comprising the steps of,

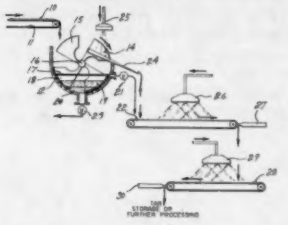
adding a suitable suspension liquid to a tar sand mixture,

striking the tar sand mixture with a plurality of striker arms to separate tar from sand particles and agglomerate tar into droplets,

ceasing striking and allowing the sand particles to settle and tar droplets to rise and float,

skimming the floating tar droplets,

scraping the tar droplets from the plurality of striker arms, and,



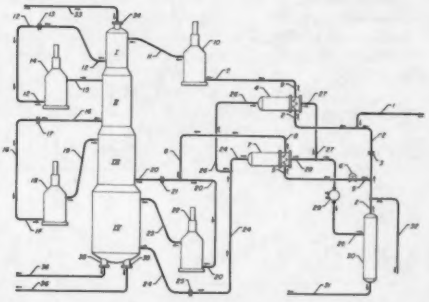
washing tar droplets recovered by skimming and scraping at least once to remove further sand particles.

4,250,018

MULTIPLE STAGE HYDROCARBON CONVERSION PROCESS

Kenneth D. Peters, Elmhurst, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Sep. 6, 1979, Ser. No. 73,168
Int. Cl.[3] C10G *35/2, 65/02*
U.S. Cl. 208—49 **9 Claims**



1. In a multiple stage hydrocarbonaceous feedstock conversion system wherein (1) a recycled hydrogen-rich vapor phase is admixed with said feedstock to provide a mixture having a hydrogen/hydrocarbon mole ratio of from about 0.5:1 to about 10:1, (2) said mixture is heated and processed serially through a series of four reaction zones, (3) each reaction zone effluent is heated prior to introduction into the next succeeding reaction zone, and (4) catalyst particles are movable through an annular-form bed in each reaction zone via gravity flow, the method of effecting the conversion of said feedstock which comprises the steps of:

(a) initially introducing from about 40 to about 80 mole % of said hydrogen into the first reaction zone of said series of reaction zones by admixing only a sufficient portion of the hydrogen-rich vapor phase with said feedstock, heating, and introducing the heated mixture into said first reaction zone at hydrocarbon conversion conditions;

(b) introducing the balance of said hydrogen into the fourth reaction zone of said series by admixing the remaining portion of said recycled hydrogen-rich vapor phase with the effluent from the third reaction zone of the series, heating, and introducing the heated mixture into said fourth reaction zone at hydrocarbon conversion conditions;

(c) restricting the effluent flow of at least one reaction zone by means of a fixed restriction orifice, and separating the fourth reaction zone effluent into a normally liquid product phase and a hydrogen-rich vapor phase;

(d) recovering at least a portion of said hydrogen-rich vapor phase for recycle to said first reaction zone in accordance with step (a) and to said fourth reaction zone in accordance with step (b), each of the aforesaid flow restrictions effecting an increase in the pressure drop across said plurality of reaction zones of from about 1 to about 10 psi;

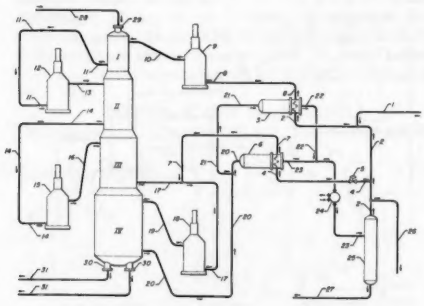
(e) at least periodically withdrawing catalyst from the fourth said reaction zone; and,

(f) at least periodically introducing fresh or regenerated catalyst into the first of said reaction zones.

4,250,019
MULTIPLE STAGE HYDROCARBON CONVERSION PROCESS

Kenneth D. Peters, Elmhurst, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Sep. 6, 1979, Ser. No. 73,169
Int. Cl.³ C10G *63/02*
U.S. Cl. 208—49 **6 Claims**



1. In a multiple stage hydrocarbonaceous feedstock conversion system wherein (1) a mixture of hydrogen and said hydrocarbonaceous feedstock with a hydrogen/hydrocarbon mole ratio of from about 0.5:1 to about 10:1 is heated and processed serially through a series of four catalytic reaction zones, (2) the reaction product effluent from each reaction zone is heated prior to introduction into the next succeeding zone, and (3) catalyst particles are movable through each reaction zone via gravity flow, the method of effecting the conversion of said feedstock which comprises the steps of:

initially admixing from about 40 to about 80 mole percent of said hydrogen with said hydrocarbonaceous feedstock, heating the mixture, and introducing the heated mixture into the first reaction zone of said multiple stage hydrocarbonaceous feedstock conversion system at hydrocarbon conversion conditions;

(b) heating and admixing the balance of said hydrogen with the effluent from the third reaction zone of said series, heating the mixture, and introducing the heated mixture into the next succeeding reaction zone at hydrocarbon conversion conditions;

(c) recovering the effluent from the fourth of said reaction zones in the series;

(d) at least periodically withdrawing catalyst particles from the fourth reaction zone; and,

(e) at least periodically introducing fresh or regenerated catalyst particles into said first reaction zone.

4,250,020
HYDROCARBON CONVERSION WITH AN ATTENUATED SUPERACTIVE MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 833,332, Sep. 14, 1977, Pat. No. 4,165,276. This application Jul. 16, 1979, Ser. No. 57,623
The portion of the term of this patent subsequent to Aug. 21, 1996, has been disclaimed.
Int. Cl.³ C10G *35/08*
U.S. Cl. 208—139 **21 Claims**

1. A process for converting a hydrocarbon at hydrocarbon conversion conditions which comprises contacting said hydrocarbon with a catalytic composite comprising a combination of a catalytically effective amount of a pyrolyzed rhenium carbonyl component with a porous carrier material containing a uniform dispersion of catalytically effective amounts of a platinum group component, which is maintained in the elemental state during the incorporation and pyrolysis of the rhenium carbonyl component, and of a germanium component.

4,250,021
TREATING USED HYDROCARBON LUBRICATING OILS

Andor L. Salusinszky, 27 Bertram St., Burwood, Victoria, Australia

Filed Aug. 29, 1979, Ser. No. 70,713
Claims priority, application Australia, Sep. 28, 1979, PD6150
Int. Cl.³ C10M *11/00*
U.S. Cl. 208—181 **10 Claims**

1. Process for removing water and at least one metal from used hydrocarbon lubricating oil comprising treating said used oil with an aqueous solution containing a surfactant and anions which form an insoluble salt with at least one metal present in the said used oil, said anions being selected from the group consisting of;

(a) oxalate,

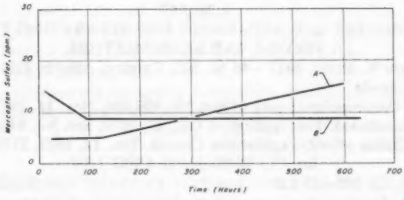
(b) chromate, and

(c) at least two of oxalate, chromate, phosphate and sulfate, and separating an oil layer of reduced metal and water content from the aqueous solution.

4,250,022
CATALYTIC OXIDATION OF MERCAPTAN IN PETROLEUM DISTILLATE

Robert R. Frame, Glenview, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 15, 1979, Ser. No. 66,741
Int. Cl.³ C10G *27/06*
U.S. Cl. 208—206 **9 Claims**



1. A method for treating a mercaptan-containing sour petroleum distillate by contacting said distillate in the presence of a alkaline reagent and an oxidizing agent at oxidation conditions with a catalytic composite prepared by contacting a solid adsorptive support with a solution of a metal chelate and with a substituted ammonium compound represented by the structural formula

$$\left[\begin{array}{c} R \\ R'-N-R \\ R \end{array}\right]^{+} X^{-}$$

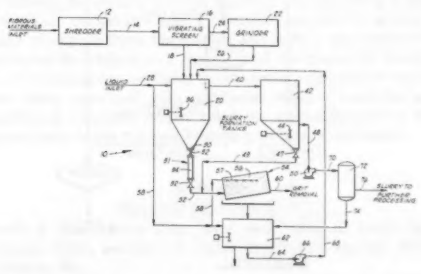
wherein R is a hydrocarbon radical containing up to about 20 carbon atoms and selected from the group consisting of alkyl, cycloalkyl, aryl, alkaryl and aralkyl, R' is a substantially straight-chain alkyl radical containing from about 5 to about 20 carbon atoms, and X is an anion selected from the group consisting of halide, nitrate, nitrite, sulfate, phosphate, acetate, citrate, tartrate and hydroxide and wherein said prepared composite is heated to a temperature below the temperature of decomposition of the metal chelate or the substituted ammonium compound before said contact with said distillate.

4,250,023

METHOD AND SYSTEM FOR SLURRYING FIBROUS ORGANIC MATERIALS AND REMOVING GRIT THEREFROM

James M. Samis, Oklahoma City, and Walter C. Waechter, Edmond, both of Okla., assignors to Thermonetics, Inc., Oklahoma City, Okla.

Filed Jul. 20, 1979, Ser. No. 59,490
Int. Cl.³ B03B *7/00*
U.S. Cl. 209—3 **23 Claims**



1. A method of slurrying fibrous organic materials containing grit and removing grit therefrom comprising:

(a) particulating said materials;

(b) combining said particulated materials with a liquid to form a slurry of suspendable grit and materials contained therein;

(c) separating non-suspendable grit and materials contained in said particulated materials from said slurry; and

(d) separating suspended grit contained in said slurry therefrom.

14. A system for slurrying fibrous organic materials containing grit and removing grit therefrom comprising:

(a) means for shredding said fibrous organic materials;

(b) a slurry formation and gravity separation tank having a shredded fibrous organic materials inlet, a liquid inlet, a slurry outlet, and a non-suspended grit and materials outlet;

(c) means for conducting shredded fibrous organic materials connected between said means for shredding fibrous organic materials and said tank;

(d) means for separating suspended grit from a slurry containing suspended fibrous organic materials and grit having a slurry inlet, a slurry outlet and a separated grit outlet; and

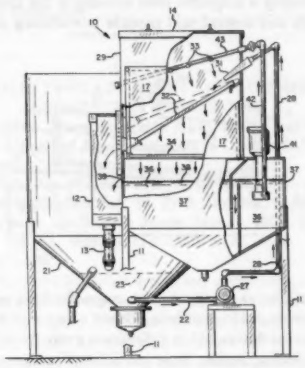
(e) conduit means for conducting slurry connected between said slurry outlet of said tank and said means for separating suspended grit from a slurry containing suspended fibrous organic materials and grit.

4,250,024

GLASS BEAD SEPARATOR

Paul Soares, Belmont, and Henry J. Stanley, Sunnyvale, both of Calif., assignors to Vacu*Blast Corporation, Belmont, Calif.

Filed Mar. 15, 1979, Ser. No. 21,302
Int. Cl.³ B07B *1/04*
U.S. Cl. 209—10 **16 Claims**



1. A continuous bead separator for use with glass bead slurry blasting wherein blasting takes place at a blasting location and the used slurry, including reusable beads, some broken and undersized beads, and other debris from the blasting operation, is collected in a hopper, comprising:

a frame;

a useable bead separator screen sized to retain useable beads but to pass the remainder of the slurry, mounted on the frame at an oblique angle so that the separated useable beads travel down and off the lower end of the screen by gravity;

conduit and pump means for taking used slurry from the blasting location hopper and lifting and delivering it onto the useable bead separator screen as a slurry;

second separation means below the useable bead separator screen for separating out undersized beads and debris, and producing relatively clear liquid;

holding means for containing said relatively clear liquid from the second separator means;

means for spraying said relatively clear liquid from the holding means over the useable bead separator screen as the used slurry progresses down the screen to help separate and wash the useable beads from the slurry, with the sprayed liquid dropping and returning to the clear liquid holding means following spraying;

means for mixing relatively clear liquid from the second separator means with the removed useable beads to reconstitute a slurry; and

return conduit means for delivering the reconstituted slurry back to the blasting location.

4,250,025

SIEVING DEVICE FOR MAGNETICALLY SUSCEPTIBLE PARTICLES

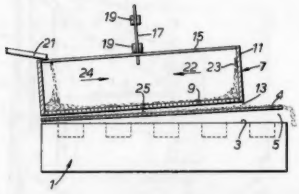
Robert J. Causton, St. Neots, and Joseph Richardson, Cleckheaton, both of England, assignors to Davy-Loewy Limited, Sheffield, England

Filed Apr. 24, 1979, Ser. No. 32,965
Claims priority, application United Kingdom, Apr. 28, 1978, 16962/78
Int. Cl.³ B03C *1/30*
U.S. Cl. 209—38 **10 Claims**

1. A sieving device comprising

a sieve having a mesh with openings of a given size therethrough,

means for introducing particles of magnetically susceptible material some of which are of a size greater than said openings and some of which are of a size less than said openings on to the surface of a first side of the mesh; an electric linear thrust device of elongate form spaced from the mesh on the side there of remote from the particle introducing means, said thrust device, when energized, producing a magnetic field moving in the direction of its length and toward said particle introducing means;



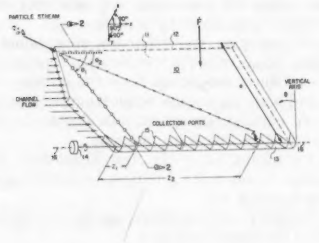
said particles experiencing the magnetic field produced by the thrust device and being thrust along a path parallel to the thrust device but in a direction away from the particle introducing means, those particles of a size greater than said openings moving along a path on the surface of the mesh on to which they are introduced and those particles of a size less than said openings passing through the openings and moving along a path which is on the same side of the mesh as said thrust device.

4,250,026

CONTINUOUS STERIC FFF DEVICE FOR THE SIZE SEPARATION OF PARTICLES

John C. Giddings, and Marcus N. Myers, both of Salt Lake City, Utah, assignors to University of Utah, Salt Lake City, Utah

Filed May 14, 1979, Ser. No. 38,592
Int. Cl.³ B03B *5/00*
U.S. Cl. 209—155 **15 Claims**



1. Apparatus for Continuous Steric FFF comprising:

(a) a field flow fractionation system having an elongate flow channel formed between opposing side wall surfaces and between narrow top and bottom wall surfaces, one of said side wall surfaces being a smooth restraining wall against which particles to be entrained in a fluid medium within said channel may be urged into common particle sizes;

(b) means for introducing and maintaining a substantially uniform flow of fluid medium along a length of said channel;

(c) particle inlet means coupled to said channel and positioned toward an upstream location of said channel and near said top wall surface, thereby adapting said system with a conduit for infusion of particles to be fractionated; and

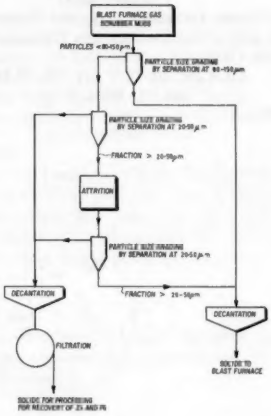
(d) means for developing a force field represented by a field vector whose direction is at an acute angle with respect to said restraining wall and having a component toward said bottom wall surface, said force field having capacity to interact with a class of particles to be entrained within said channel.

4,250,027

METHOD FOR RECOVERING THE LEAD AND ZINC VALUES IN SECONDARY SCRUBBER MUDS FROM BLAST FURNACE GASES

Jean M. Cases; Georges Valence, both of Vandoeuvre, and Olivier Lietard, Precy sur Oise, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Filed Jan. 29, 1979, Ser. No. 7,182
Claims priority, application France, Jan. 31, 1978, 78 02676
Int. Cl.³ B07B *1/00*
U.S. Cl. 209—233 **5 Claims**



1. A process for recovering lead and zinc values from blast furnace scrubber mud which comprises:

(a) separating from said mud a fraction having a particle size greater than about 10 to 50 μm;

(b) scouring by attrition said fraction having a particle size greater than about 10 to 50 μm to separate lead and zinc values from said fraction;

(c) separating the particles from steps (a) and (b) having a size less than about 10 to 50 μm for recovery of the lead and zinc values contained therein; and

(d) recycling to the feed of the blast furnace the fractions from steps (a) and (b) having a particle size greater than about 10 to 50 μm.

4,250,028

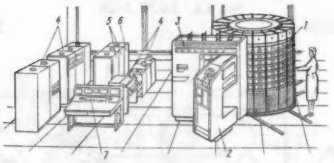
MACHINE FOR SORTING AND RETRIEVAL OF FLAT OBJECTS

Nikolai V. Talyzin, Novo-konjusherny, pereulok, 11, kv. 37; Solomon M. Rozengauz, ulitsa Marshala, Birjuzova, 43, kv. 142; Vasily F. Tikhonov, ulitsa Narodnogo opolchenia, 20, kv. 170, and Nikolai K. Mosolov, 3 Khoroshevskaya, ulitsa, 5, korpus 1, kv. 50, all of Moscow, U.S.S.R.

Filed May 11, 1979, Ser. No. 38,110
Claims priority, application U.S.S.R., Jun. 8, 1978, 2627908
Int. Cl.³ B07C *3/10*
U.S. Cl. 209—583 **7 Claims**

1. In a machine for sorting and retrieval of flat objects,

comprising a cylindrical housing on whose walls storages of objects are arranged in several decks over the periphery thereof, and means designed for conveying the objects and fashioned as a squirrel-cage return drum accommodated inside the housing, said drum carrying on its spokes, for movement along the latter, object holders designed to convey the objects to the storages, containers for delivering the objects from the storages and cams for moving storage platforms upon the extraction of objects, which cams cooperate by means of selector modules with a respective distributing channel of a stationary vertical cylindrical master form, said machine further comprising means for feeding the objects into the machine having a mechanism for feeding an array of objects with a mechanism for separating the objects one-by-one from the



array and means for identifying a distinguishing feature of each object, a conveyer for conveying the objects out of the machine and means for automatic control of the machine, an improvement consisting in that the machine further comprises a means for transferring a group of objects from a preset storage mounted on the cylindrical housing to the means designed for feeding the objects into the machine and including a platform which cooperates with a container adapted to deliver a group of objects from the storage and with a mechanism for delivering the objects to a separator of the means for feeding the objects into the machine, the stationary cylindrical master form being provided with additional selector modules and distributing channels closed over the circumference of the master form in the top and bottom portions of the latter.

4,250,029

COATED MEMBRANES

Ernest J. Kiser, Iowa City, Iowa, and James A. Latty, Seal Beach, Calif., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Apr. 25, 1977, Ser. No. 790,523
Int. Cl.³ B01D *13/00*
U.S. Cl. 210—652 **20 Claims**

15. A method of deionizing a solution containing solubilized ionic materials which comprises passing said solution over an ion-rejecting membrane comprising a semi-permeable polymeric membrane substrate having affixed to an active membrane surface a series of contiguous, microscopically thin coatings or layers of polymeric materials consisting of cationic polymeric polyelectrolytes, anionic polymeric polyelectrolytes, and essentially nonionic porous polymers, with at least one pair of oppositely charged polyelectrolyte coatings separated by an interposing coating of said essentially nonionic porous polymer, and said polymeric materials being substantive to the surface of the polymeric membrane substrate under ordinary membrane filtration conditions.

4,250,030

PROCESS FOR THE REMOVAL OF CYANIDES FROM EFFLUENT

Wouterus J. M. Kuit, Trail, and Alan R. Babcock, both of Trail, Canada, assignors to Cominco Ltd., Vancouver, Canada

Filed Jan. 21, 1980, Ser. No. 113,993
Claims priority, application Canada, Oct. 26, 1979, 338593
Int. Cl.³ B01D *15/00*
U.S. Cl. 210—684 **22 Claims**

1. A method for the removal of dissolved free and complex cyanides from water-containing effluent which comprises controlling the pH of said effluent in a range of about 7.0 to 8.5 and contacting said effluent with an effective amount of an insoluble solid iron sulfide chosen from at least one of ferrous sulfide and ferric sulfide having particle sizes smaller than about 300μ for a period of time of at least about 5 minutes to remove said dissolved free and complex cyanides to a desired level, said effective amount being sufficient to give a weight ratio of said iron sulfide to total cyanide in said effluent of greater than about 2:1.

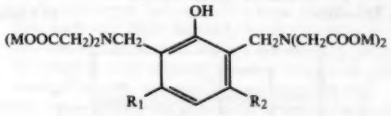
4,250,031

PHENOLIC CHELATE RESIN AND METHOD OF ADSORPTION TREATMENT

Hiroyuki Uejima, Nara; Masahide Hirai, Kyoto, and Masahiro Kazigase, Uji, all of Japan, assignors to Unitika Ltd., Amagasaki, Japan

Division of Ser. No. 882,307, Mar. 1, 1978, Pat. No. 4,197,391. This application Sep. 18, 1979, Ser. No. 76,656
Claims priority, application Japan, Mar. 1, 1977, 52-22479
Int. Cl.³ B01J *39/18*; C02F *1/42, 1/56*
U.S. Cl. 210—688 **4 Claims**

1. A method of adsorption treatment comprising selectively adsorbing at least one type of ion from the group consisting of ferric ions and cupric ions from an aqueous solution thereof with a three-dimensional phenolic chelate resin comprising the crosslinked reaction product of (a) a phenolic compound represented by the general formula (I)



(I)

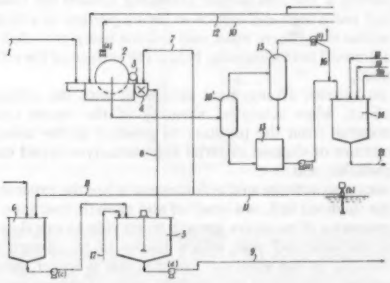
wherein M is an alkali metal atom, an ammonium group or a hydrogen atom; R_1 and R_2, which may be the same or different, each is a hydrogen atom or an alkyl group having 1 to 3 carbon atoms, with (b) a phenol and (c) an aldehyde or an aldehyde precursor.

4,250,032

PROCESS FOR THE DISPOSAL OF BAUXITE PROCESSING WASTES AND THEIR CONTAINMENT INTO FILLING BASINS

Giuseppe Costa, Rome, Italy, assignor to Eurallumina S.p.A., Portoscura, Italy

Filed Mar. 5, 1979, Ser. No. 17,484
Claims priority, application Italy, Jul. 31, 1978, 50535 A/78
Int. Cl.³ C02F *1/66, 11/14*
U.S. Cl. 423—121 **7 Claims**



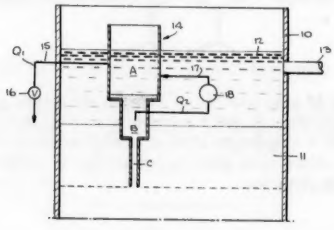
1. A process for the disposal of bauxite processing wastes containing soda from a bauxite treating plant comprising:

(a) preparing a suspension of said wastes in a washing decanter;
(b) filtering the suspension of bauxite muds to form a filtration cake;
(c) continuously washing the filtration cake on the filter with hot water to form a liquid phase having the greater part of the soda;
(d) recycling the liquid phase into the basic chemical process of the bauxite treating plant;
(e) separating the mud cake from the filter and treating each cubic meter of mud with about 0.25 cubic meters of sea water to refluidize the mud as a mud suspension with a solids content of about 35–40% and to neutralize any remaining soda;
(f) forming an admixture of the refluidized, neutralized suspension with sand residual from the bauxite processing;
(g) conveying the admixture to filling basins;
(h) adding sea water to the admixture until a density of about 1.3 kg/liter is achieved.

4,250,033
EXCESS-GROWTH CONTROL SYSTEM FOR FLUIDIZED-BED REACTOR

Robert F. Hickey, Florence, Mass., and Roger W. Owens, Deer Park, N.Y., assignors to Ecolotrol, Inc., Bethpage, N.Y.

Continuation-in-part of Ser. No. 926,207, Jul. 19, 1978, Pat. No. 4,177,144. This application Jul. 6, 1979, Ser. No. 55,149
The portion of the term of this patent subsequent to Dec. 4, 1996, has been disclaimed.
Int. Cl.³ B01D *15/02*
U.S. Cl. 210—106 **10 Claims**



1. A control system for preventing accumulation of excessive cellular material in a fluidized-bed reactor wherein waste water or other liquid to be processed is conducted upwardly therein at a velocity conducive to fluidization through a bed of particles which function as a carrier for the growth of the material, a head of effluent being developed above the bed from which the effluent is discharged from the reactor; the system comprising:

A. a separator column disposed in the reactor, said column having a low end section extending toward the fluidized bed and a high end section at least a portion of which lies within the effluent head, said column being provided with a drawoff port somewhat below the surface of the effluent head;

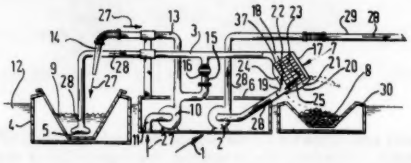
B. an agitator arrangement associated with the column to effect, when activated, shearing of the excess cellular material from the particles to produce in the column a mixture of sheared material and partially-stripped carrier particles; and

C. means to activate said arrangement when the expansion of the fluidized bed, as a result of said growth, reaches a limit indicative of excessive growth to provide an exit flow rate at the draw-off port which results in an upward flow velocity in the separator column that is lower than the settling velocity of the partially-stripped carrier particles but higher than the settling velocity of the sheared material whereby the sheared material is washed away through the drawoff port, said low end section having a diameter that is smaller than the high end section whereby if the upward velocity in the high end section is at a value causing some sheared material as well as carrier particles to settle therein, the velocity in the low end section is at a higher value to prevent back-up of said sheared material into the reactor.

4,250,034
TRANSPORT CONDUIT

Tjako A. Wolters, Zeist, Netherlands, assignor to Ballast-Nedam Groep N.V., Amstelveen and Amsterdamse Ballast Bagger, Utrecht, both of, Netherlands

Filed Jan. 23, 1979, Ser. No. 5,716
Claims priority, application Netherlands, Jan. 26, 1978, 7800935
Int. Cl.³ E02F *5/28*
U.S. Cl. 210—170 **2 Claims**



1. A transport conduit including a suction pipe connected with a pump, carried by a floating body and having a nozzle and at least one stationary stone catcher included in the suction pipe and disposed on deck for sieving out large stones and/or other large objects from the dredged material, for example, spoil, said stone catcher comprising a stone catcher housing having a mixture inlet, a mixture outlet and a stone outlet provided with a single door hermetically closed against the open air and hinged to the stone catcher housing, which is provided with a grid basket to be traversed from a high to a low level and surrounded by an outlet chamber to be traversed by the mixture and opening out in said mixture outlet, said stone catcher housing being provided with additional discharge means permanently fixed thereto for loosening the stones collected in the grid basket, said additional discharge means comprising a flushing duct communicating with said housing.

2. A system for transporting dredged material, which comprises a container having a supply of dredged material which contains large objects such as stones, pump means for supplying water to said container in such quantity as to fluidize the dredged material, a suction nozzle disposed within said container for picking up a fluid suspension of the dredged material, a suction pump having an inlet connected to said suction nozzle and an outlet delivering a stream of fluidized dredged material, and stone catcher means located between said inlet of the suction pump and said suction nozzle for removing said large objects before reaching said suction pump, said stone catcher means comprising a housing having an inlet connected to said suction nozzle and an outlet connected to the inlet of said suction pump, a grid basket within said housing and defining a chamber between the grid basket and said housing in surrounding relation to the grid basket and communicating with the outlet of the housing, the inlet of said housing being adjacent the uppermost part thereof and the outlet of the housing being adjacent the lowermost part thereof and said grid basket having an upper opening cooperating with the inlet of the housing so that the large objects retained within the grid basket minimally impede the flow of fluidized dredged material to said outlet chamber, said housing also having a stone discharge opening and including a single door cooperating with said stone discharge opening and with said grid basket to allow large objects to be discharged therefrom when the door is open, and conduit means connected to said pump means and

said housing for forcibly removing accumulated large objects from said grid basket when said door is open.

4,250,035

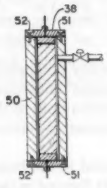
RADIAL COMPRESSION OF PACKED BEDS

Patrick D. McDonald, Holliston, and Carl W. Rausch, Auburndale, both of Mass., assignors to Waters Associates, Inc., Milford, Mass.

Continuation of Ser. No. 848,752, Nov. 4, 1977, abandoned, which is a continuation of Ser. No. 638,301, Dec. 8, 1975, abandoned. This application Nov. 13, 1978, Ser. No. 960,606

Int. Cl.³ B01D *15/08*

U.S. Cl. 210—198.2 **41 Claims**



21. In an apparatus of the type comprising an elongate chamber having an inlet adapted to receive fluid at one end thereof and a port adapted to discharge fluid at the other end thereof, and further comprising a porous mass a stationary phase of liquid chromatographic packing material substantially filling said chamber, said porous mass forming means to intimately contact said fluid as it passes through the chamber, the improvement wherein said chamber wall is a pre-stressed diaphragm forming means to radially compress said porous mass and maintain said mass in a substantially uniform state of compression of packing material throughout said chamber during shipment or use.

4,250,036

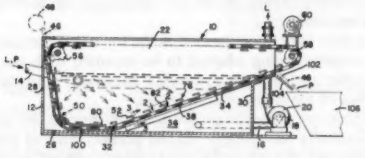
CONVEYING MEANS FOR USE IN FILTERING DEVICES

David G. Parshall, Northville, Mich., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Aug. 9, 1979, Ser. No. 65,059

Int. Cl.³ B01D *35/16, 33/36*

U.S. Cl. 210—297 **3 Claims**



1. In a filter device particularly adapted for separating particulate matter from a liquid flow, the improvement therein comprising,

a tank to receive said flow of said liquid and said particulate matter from an inlet connected thereto, said tank having a bottom including a gravity settling area located adjacent to said inlet, a pass-through section located downstream from said gravity settling area, and an inclined partition connecting said pass-through section to a particulate disposition point in said tank,

a vacuum box comprising a liquid-tight enclosure carried by said tank below said pass-through section to receive said liquid therein,

separating means carried by said filter device and interfacing between said tank and said vacuum box and forming part of said pass-through section, said means allowing said liquid to flow into said vacuum box and inhibiting said flow of said particulate matter causing said particulate matter to collect on said means, and

conveying means for moving said particulate matter collected in said settling area and on said separating means and transferring said particulate matter over said inclined partition to said disposition point, said conveying means further comprising,

a pair of spaced driving elements each formable into an endless loop so as to be operatively carriable by sprocket means connectable to said filter device, said elements in part disposable in said tank to engage with said settling area, said pass-through section, and said inclined partition, said driving elements being a pair of chains having a plurality of elongated center links alternatively spaced between pairs of side bars with ends of adjacent links and side bars pivotally joined by a readily removable pin,

a plurality of spaced flight assemblies each having an elongated body transversely positioned between said driving elements with ends of said assemblies loosely engaged with said driving elements, said driving elements and said flight assemblies each forming a natural, close fitting seat with said settling area, said pass-through section, and said inclined partition therebelow, each said flight assembly including an angle-shaped flight having a bottom edge located at a lower end of a vertical leg of said flight, and an extension bar attached in an offset manner to a rear of said flight at ends of said flight, said bars projecting outwardly to engage with an elongated opening provided in said chain center link to form a loose fit with said center link, each said flight assembly having a center of gravity to maintain said vertical leg in a substantially perpendicular location with respect to said settling area, said pass-through section, and said inclined partition, and

drive means operatively connected to said driving elements to selectively advance said elements and said attached flight assemblies while said elements and said flight assemblies maintain said natural seat with said settling area, said pass-through section, and said inclined partition.

4,250,037

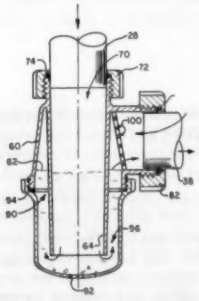
PLUMBING FIXTURE WITH INTEGRAL STRAINER

John F. Kempa, 306 SW. Cimarron Cir., Palm Bay, Fla. 32905

Filed Mar. 28, 1979, Ser. No. 24,873

Int. Cl.³ B01D *35/02*

U.S. Cl. 210—310 **3 Claims**



1. A gas trap which separates solids and other foreign bodies from liquids flowing through a pipe from sinks, laundry tubs and the like, said gas trap comprising in combination:

a conduit section having at least 3 portals including an input portal and an output portal for being operatively interposed along the pipe for passing the liquids therethrough, said conduit section further including therein an access portal and a removable closure coupled thereto for allow-

ing external access to within said conduit section, with said closure located below said input and output portals, and with said closure defining a recess therein for receiving and storing the accumulated solids within a reservoir of the liquid;

an input tube located within said conduit section and operatively coupled to said input aperture while extending into and opening below the liquid level within said reservoir of liquid adjacent to said closure, whereby a gas trip is operatively defined therein; and

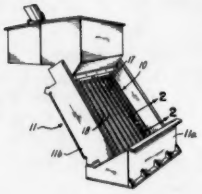
strainer means carried within said conduit section covering said output portal for separating solids from liquids flowing therethrough, with one end of said strainer means being elevated from the horizontal for allowing gravitational displacement of the solids toward said access portal, with said strainer means comprising a mesh sheet which forms an integral part of a side wall of said conduit section adjacent said output portal, whereby the solids may migrate towards said access portal after the liquid flow has subsided.

4,250,038

SCREEN DEVICE AND METHOD

Joseph L. Dryden, Galesburg, Ill., assignor to Bixby-Zimmer Engineering Co., Galesburg, Ill.

Filed Jul. 21, 1978, Ser. No. 927,136
Int. Cl.³ B01D *21/02, 25/04*
U.S. Cl. 210—409 **13 Claims**



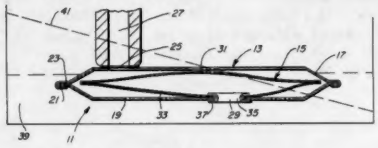
1. In a static screen device of the type comprising a screen having a working surface for use in separating the undersized component from the oversized component of a slurry flowing over said working surface, said screen comprising a plurality of rod elements, and support means retaining said rod elements in spaced apart and generally parallel relation to define said working surface and to define slots between said rod elements through which said undersized component passes to escape through the opposite surface of said screen, the improvement wherein the entire said support means is disposed remotely from said opposite surface of said screen sufficiently to minimize the liquid buildup at said opposite surface and thereby promote the efficient passage of the undersized component through said screen; and stationary mounting means is provided for mounting said screen in a fixed position and inclined from end to end whereupon the slurry will flow downwardly over said working surface, with each of said rod elements located generally horizontal and transverse to the direction of slurry flow.

4,250,039

TRANSMISSION FILTER

John F. Cozzi, Carol Stream, Ill., and Edward M. Maczko, Jr., Birmingham, Mich., assignors to Wire Cloth Products, Inc., Bellwood, Ill.

Filed May 7, 1979, Ser. No. 36,650
Int. Cl.³ B01D *35/02*
U.S. Cl. 210—416.5 **6 Claims**



1. A transmission filter comprising:

a rigid non-perforated container sealed to prevent direct entry of transmission fluid to the interior of said container when said container is submerged in the transmission fluid;

an intake port formed in the bottom of said container;

a suction outlet port formed in the top of said container, said container being adapted to be mounted with said suction outlet port in fluid conveying alignment with the suction line of the transmission system;

a filter envelope positioned inside said container, said filter envelope having a continuous seal to preclude passage of transmission fluid other than through the filter material itself;

an intake opening formed in said filter envelope to match said intake port to permit unfiltered transmission fluid to pass to the interior of said filter envelope only through the bottom of said container; and

attaching means to sealingly secure said intake opening of said filter envelope in alignment with said intake port of said container to permit transmission fluid to reach the interior of said container outside said filter envelope for removal out said suction outlet port only after passing through the filter material of said filter envelope.

6. A transmission filter comprising:

a rigid metallic non-perforated container crimped about the outer edges thereof to provide a fluid-tight seal that prevents direct entry of transmission fluid to the interior of said container when said container is submerged in the transmission fluid;

a generally oblong intake port formed in the bottom of said container;

a suction outlet port formed in the top of said container, said container being adapted to be mounted with said suction outlet port in fluid conveying alignment with the suction line of the transmission system;

a first sheet of thermoplastic fiber felt having the shape of a generally triangularly shaped portion with its base along one end of a generally rectangularly shaped portion, said generally triangularly shaped portion having a rounded apex and said generally reactangularly shaped portion having one side longer than the other;

a second sheet of thermoplastic fiber felt having a generally rectangularly shaped portion corresponding to the generally rectangularly shaped portion of said first sheet and a truncated base portion of a generally triangularly shaped portion corresponding to a part adjacent the base of the generally rectangularly shaped portion of said first sheet;

a continuously sealed connecting joint formed between said sheets of thermoplastic fiber felt as the result of an ultrasonic weld between said sheets and located about the periphery of the shape defined by said second sheet to form a filter envelope, said filter envelope being located inside said container;

a generally oblong intake opening formed in said second sheet to match said intake port;

a metal eyelet crimped over the parts of said second sheet of felt and the bottom of said container about said intake opening and said intake port respectively to permit unfiltered transmission fluid to reach the interior of the filter envelope formed by the ultrasonic welding of said sheets of thermoplastic fiber felt only through the bottom of said container, the transmission fluid being filtered through said filter envelope before passing out said suction outlet port;

a generally trapezoidal opening formed in the generally triangularly shaped portion of said first sheet of fiber felt beyond where said sheets are ultrasonically welded together to permit flow of transmission fluid to said suction outlet port from either side of said filter envelope; and

matching pear-shaped openings formed in said sheets of fiber felt to receive a mounting bolt for the filter, the portion about said pear-shaped openings being ultrasonically welded to provide a continuous seal.

4,250,040

METHOD FOR PURIFYING SEPTIC TANK EFFLUENT

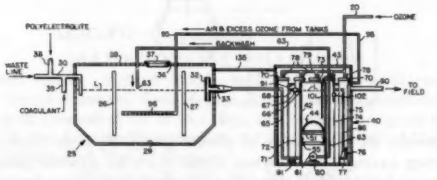
Julius LaRaus, 150 Crandon Way, Rochester, N.Y. 14618

Continuation-in-part of Ser. No. 687,041, May 17, 1976, Pat. No. 4,104,166. This application Jul. 19, 1978, Ser. No. 926,025

The portion of the term of this patent subsequent to Aug. 1, 1995, has been disclaimed.

Int. Cl.[3] C02F *1/78*

U.S. Cl. 210—760 **8 Claims**



1. A method of purifying septic tank effluent flowing at substantially atmospheric pressure, comprising

passing liquid effluent by gravity from a septic tank successively through a plurality of serially-connected tanks, the first of which tanks in said series contains a filter for mechanically filtering solids from the liquid as it passes through said first tank,

intermittently feeding ozone gas through each of the remainder of said serially-connected tanks during the passage of said liquid through said remaining tanks,

collecting the ozonated liquid in a reservoir after passage thereof through the last of said serially-connected tanks,

allowing the ozonated liquid to flow by gravity out of said reservoir from an opening adjacent the upper end thereof,

conveying excess ozone gas from said remaining tanks to said septic tank, and

periodically backwashing said filter by reversing the flow of liquid through said first tank and the filter therein, and returning the backwash liquid to said septic tank,

said backwashing step including using at least some liquid from said reservoir for backwashing said filter.

4,250,041

REMOVAL OF HEPARIN FROM BLOOD PLASMA SAMPLES USING AN INSOLUBLE PROTAMINE REACTION PRODUCT

Arthur L. Babson, Chester, and James E. Turner, Morristown, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 931,033, Aug. 4, 1978, Pat. No. 4,199,502. This application Jun. 25, 1979, Ser. No. 51,779

Int. Cl.[3] A61K *35/16, 49/00;* **C08B** *37/10;* **G01N** *1/00*

U.S. Cl. 252—1 **8 Claims**

1. A method for removing substantially all heparin from a heparin-containing blood plasma test sample which comprises:

A. Adding from about 10 to about 20 mg. of the insoluble protamine/glutaraldehyde reaction product prepared by incubating an aqueous solution containing:

I. From about 1.5 to about 2.5 grams of protamine sulfate;

II. From about 20 to about 30 milliliters of water;

III. From about 20 to about 30 milliliters of phosphate buffer; and

IV. From about 6 to about 9 milliliters of a 10% solution of glutaraldehyde in phosphate buffer;

at a pH of from about 6 to about 12 and a temperature of from about 4° C. to about 10° C. overnight;

per milliliter of plasma to the plasma sample;

B. Agitating (A) until substantially all the heparin present in the plasma sample is adsorbed by and complexed with the insoluble protamine/glutaraldehyde reaction product;

C. Allowing (B) to stand for a time sufficient to allow precipitation of the free and complexed insoluble protamine/glutaraldehyde reaction product;

D. Removing the precipitate of (C) from the plasma sample to obtain substantially heparin-free plasma suitable for coagulation testing.

4,250,042

CORROSION INHIBITION IN WELL-DRILLING OPERATIONS USING AQUEOUS SYSTEMS CONTAINING AMMONIUM CARBOXYLATES

William A. Higgins, Gates Mills, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed Apr. 16, 1979, Ser. No. 30,577

Int. Cl.[3] C09K *7/02*

U.S. Cl. 252—8.5 C **5 Claims**

1. A method of inhibiting metal corrosion in earth drilling operations employing aqueous drilling fluids which comprises including in the drilling fluids employed in such operations at least one water-soluble ammonium carboxylate salt made from at least one polycarboxylic acid (I) corresponding to the formula

$$R(COOH)_{2-3} \quad (I)$$

wherein R is an alkylene, alkenylene or hydroxyl alkylene group of about 4 to about 15 carbons, with (II) ammonia

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4,250,043

DETERGENT-COMPATIBLE ANTISTATIC COMPOSITIONS

Kenneth L. Jones, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 19, 1979, Ser. No. 59,007

Int. Cl.[3] D06M *13/00, 13/46, 13/20, 13/36*

U.S. Cl. 252—8.6 **13 Claims**

1. A particulate detergent additive product for preventing static buildup on textiles when applied thereto from a detergent wash liquor, said particulate product consisting essentially of:

(a) from about 80% to about 10% by weight of a water-soluble inorganic salt encapsulated in

(b) from about 20% to about 90% by weight of a dispersion inhibitor, being a solid organic material having a solubility in water of 50 ppm max at 25° C. and a softening point in

the range of 100° F. to 200° F., said material being selected from the group consisting of paraffinic waxes, cyclic and acyclic mono- and polyhydric alcohols, substituted and unsubstituted aliphatic carboxylic acids, esters of the foregoing alcohols and acids, C_3-C_4 alkylene oxide condensates of any of the foregoing alcohols and acids, and mixtures thereof,

substantially all of the individual particles having a size within the range of 10 microns to 500 microns, said particulate detergent additive product being free of quaternary, ammonium, antistatic compounds.

4,250,044

BREAKER SYSTEM FOR HIGH VISCOSITY FLUIDS

Jerald J. Hinkel, Broken Arrow, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 26, 1978, Ser. No. 919,336
Int. Cl.³ E21B *43/26*
U.S. Cl. 252—8.55 R **21 Claims**

1. A method of fracturing a subterranean formation penetrated by a borehole, wherein the static temperature of the borehole adjacent said formation is within the range of from about 50° F. to about 125° F., comprising: injecting into the borehole and into contact with the formation at a rate and pressure sufficient to fracture said formation, a water-based fluid at a pH of from about 7 to about 12 and comprising

(a) an aqueous liquid,

(b) as a thickening agent to increase the viscosity of the aqueous liquid, a viscosity increasing amount of a polysaccharide which is soluble or dispersible in the aqueous liquid, and

(c) as a breaker to reduce the viscosity of the fluid after said fluid has contacted the formation and after its intended purpose as a viscous fluid has been served, the combination comprising an effective amount of (i) triethanolamine, and (ii) at least one compound selected from the group consisting of ammonium persulfates and alkali metal persulfates in at least partially water soluble form.

4,250,045

POLYMERIZED FATTY ACID AMINE DERIVATIVES USEFUL AS FRICTION AND WEAR-REDUCING ADDITIVES

Keith Coupland, Sarnia, and Clinton R. Smith, Camlachie, both of Canada, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jun. 22, 1979, Ser. No. 51,040
Int. Cl.³ C10M *1/48*
U.S. Cl. 252—32.7 E **6 Claims**

1. A liquid hydrocarbon lubricating oil composition comprising a major proportion of a liquid hydrocarbon lubricating oil and from about 0.01 to 10 wt. % of a friction-reducing additive, said additive being a hydrocarbon soluble diprimary diamine of a dimerized C_{19}–C_{60} fatty acid or derivative thereof, said derivative being a cyanoethylated or amine propylamine derivative.

3. A composition according to claim **1** wherein said additive is a dimeramine of a dimerized natural fatty acid and said composition further comprising metal dialkyl dithiophosphate antiwear additive.

4,250,046

DIETHANOL DISULFIDE AS AN EXTREME PRESSURE AND ANTI-WEAR ADDITIVE IN WATER SOLUBLE METALWORKING FLUIDS

John L. Przybylinski, West Goshen Township, West Chester County, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Mar. 5, 1979, Ser. No. 17,218
Int. Cl.³ C10M *3/06*
U.S. Cl. 252—49.3 **10 Claims**

1. A water-soluble metalworking fluid comprising at least 0.05% by weight of diethanol disulfide, at least about 0.05% by weight of one or more water-soluble polyoxyalkylene glycols having a minimum molecular weight of about 100, with the balance being water.

4. A water-soluble metalworking fluid comprising from about 0.05% to 1% by weight of diethanol disulfide, from about 0.05% to 5% by weight of one or more water-soluble polyoxyalkylene glycols selected from the group consisting of polyoxyethylene glycol, polyoxypropylene glycol and mixed polyoxyethylene-polyoxypropylene glycol, having a minimum molecular weight of about 100, an effective amount of at least one water-soluble metalworking fluid additive selected from the group consisting of lubricity agent, rust preventative, wetting agent, defoaming agent, germicidal agent, chelating agent, nonferrous metal corrosion inhibitor, dye and perfume, with the balance being water.

5. The metalworking fluid of claim **4** in which the water-soluble metalworking fluid additive is at least one water-soluble lubricity agent selected from the group consisting of ethanolamine, diethanolamine and triethanolamine fatty acid soaps in which the fatty acid moieties are derived from C_6 to C_{22} fatty acids.

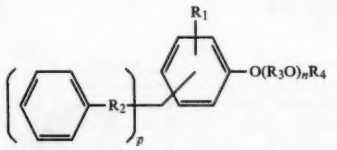
4,250,047

LUBRICANT COMPOSITIONS FOR SYNTHETIC FIBERS AND METHOD FOR LUBRICATING SYNTHETIC FIBERS

Kenichi Katabe; Takeshi Hirota, and Osamu Wakasugi, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed May 24, 1979, Ser. No. 41,924
Claims priority, application Japan, May 30, 1978, 53-64536
Int. Cl.³ C10M *1/06*
U.S. Cl. 252—49.5 **10 Claims**

1. A method for lubricating synthetic fibers which comprises treating the synthetic fibers with a composition comprising a compound of the formula:



wherein R_1 is hydrogen or phenyl group, R_2 is an alkylene group having 1 to 3 carbon atoms, R_3 is an alkylene group having 2 to 4 carbon atoms or a mixed alkylene group thereof, R_4 is hydrogen, an acyl having 1 to 18 carbon atoms or an alkyl group having 1 to 18 carbon atoms, p is a number of from 2 to 5, and n is a number of from 1 to 50.

4,250,048

METAL OXIDE REMOVER CONTAINING A STRONG MINERAL ACID, CHELATING AGENT AND A BASIC AMMONIA DERIVATIVE

Newton G. Leveskis, Auburn, Calif., assignor to Custom Research and Development, Auburn, Calif.

Continuation-in-part of Ser. No. 838,443, Sep. 30, 1977, Pat. No. 4,174,290, which is a continuation-in-part of Ser. No. 751,771, Dec. 16, 1976, abandoned. This application Jul. 3, 1979, Ser. No. 52,994
The portion of the term of this patent subsequent to Nov. 13, 1996, has been disclaimed.
Int. Cl.³ C11D *7/32, 7/26, 7/08*
U.S. Cl. 252—142 **18 Claims**

1. A composition for removing metal oxides from ferrous metals comprising: an aqueous solution containing a basic ammonia derivative selected from ammonium hydroxide and organic amines, an organic chelating agent for the metal oxides

other than citric acid and a strong mineral acid, all of said components being present in effective concentrations to remove metal oxides from the metal to be cleaned in the absence of acid corrosion and discoloration thereof, the pH of said solution being about 0.5–3.0 and the weight ratio of said ammonia derivative to said chelating agent being about 2:7 to 7:2.

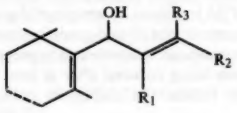
4,250,049

2,6,6-TRIMETHYL-α-(ISO)PROPENYL-1-CYCLOHEXENE-1-METHANOLS AND -1,3-CYCLOHEXADIENE-1-METHANOLS AND ORGANOLEPTIC USES THEREOF

Richard A. Wilson, Westfield; William L. Schreiber, Jackson; Braja D. Mookherjee, Holmdel, all of N.J.; Jacob Kiwala, Brooklyn, N.Y.; Joaquin F. Vinals, Red Bank, N.J.; Manfred H. Vock, Locust, N.J.; Gilbert Stork, Englewood, N.J., and Frederick L. Schmitt, Holmdel, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 39,361, May 15, 1979, Pat. No. 4,243,823.
This application Feb. 8, 1980, Ser. No. 119,860
Int. Cl.³ C11D *3/50, 9/44*
U.S. Cl. 252—174.11 **1 Claim**

1. A process for augmenting or enhancing the aroma of a solid or liquid anionic, cationic or nonionic detergent comprising the step of adding to a solid or liquid anionic, cationic or nonionic detergent base from 0.005% up to 5% by weight of at least one compound defined according to the generic structure:



wherein one of R_1, R_2 or R_3 is methyl and the other two of R_1, R_2 and R_3 is hydrogen; wherein the dashed line represents a carbon-carbon double bond or a carbon-carbon single bond with the proviso that when R_1 is hydrogen, the dashed line represents a carbon-carbon double bond.

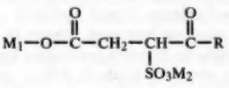
4,250,050

SULFOSUCCINATE EMULSIFIERS

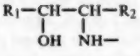
Adolf Asbeck; Michael Eckelt, both of Dusseldorf; Werner Erwied, Monheim; Rudi Heyden, Erkrath, and Manfred Petzold, Dusseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusselforf-Holthausen, Fed. Rep. of Germany

Filed Dec. 30, 1977, Ser. No. 865,881
Claims priority, application Fed. Rep. of Germany, Jan. 3, 1977, 2700072
Int. Cl.³ B01F *17/10;* **C07C** *143/18*
U.S. Cl. 252—354 **4 Claims**

1. Sulfosuccinic acid derivatives having the formula:

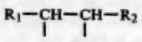


wherein R is



where R_1 and R_2 are members selected from the group consisting of hydrogen and alkyl having from 1 to 16 carbon atoms, and the sum of the carbon atoms in R_1 and R_2 is from 9 to 16, M_1 and M_2 are cations selected from the group consisting of alkali metals, ammonium, alkylammonium having 1 to 4 carbon atoms in the alkyl and alkylolammonium having 2 to 4 carbon atoms in the alkylol.

3. The sulfosuccinic acid derivative of claim 1 wherein



is derived from a nonterminal olefin having the approximate chain length distribution:
C_{11}=20%
C_{12}=30%
C_{13}=30%
C_{14}=20%.

4,250,051

PRESERVATIVE FOR USE IN CALIBRATOR COMPOSITIONS FOR BLOOD ANALYSIS

Douglas Armstrong, Coral Springs, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed Dec. 26, 1978, Ser. No. 972,930
Int. Cl.³ G01N *33/16*
U.S. Cl. 252—408 **4 Claims**

1. A stable calibrator composition, useful for calibrating instruments which determine hematological values in whole blood samples, comprising a mixture of

(a) a hemolysate of red blood cells which have been lysed with an aqueous solution of saponin, and

(b) a preservative amount of 4-chloro-3,5-xylenol, the concentration of said 4-chloro-3,5-xylenol in said hemolysate being from about 1:1000 to 1:1750 w/v, and said hemolysate having a pH between 4 and 7.

4,250,052

CATALYST STRUCTURE AND A PROCESS FOR ITS PREPARATION

Lawrence A. Smith, Jr., Houston, Tex., assignor to Chemical Research & Licensing Company, Houston, Tex.

Filed Sep. 8, 1978, Ser. No. 940,466
Int. Cl.² B01J *31/06, 35/02*
U.S. Cl. 252—426 **7 Claims**

1. A process for preparing structures of sulfonated cation resin catalyst comprising:

(a) preparing a vinyl aromatic polymer or copolymer structure by dissolving said polymer or copolymer in a solvent and coating a base having a distillation packing structure therewith and removing said solvent to leave a coating of polymer or copolymer over said base and

(b) sulfonating said structure.

4,250,053

SENSITIZED AROMATIC IODONIUM OR AROMATIC SULFONIUM SALT PHOTOINITIATOR SYSTEMS

George H. Smith, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed May 21, 1979, Ser. No. 40,645
Int. Cl.³ B01J *31/02, 31/12*
U.S. Cl. 252—426 **17 Claims**

1. A sensitized iodonium or sulfonium photoinitiator system comprising one part of an aromatic sulfonium salt or an aromatic iodonium salt photoinitiator associated with 0.01 to 10 parts of a fluorescent compound selected from polyarylenes, polyarylpolyenes, 2,5-diphenylisobenzofurans, 2,5-diarylfurans, 2,5-diarylthiofurans, 2,5-diarylpyrroles, 2,5-diarylcyclopentadienes, polyarylphenylenes, coumarins, and polyaryl-2-pyrazolines.

4,250,054
CATALYSTS FOR PRODUCING UNSATURATED ALIPHATIC ACIDS

Wilfrid G. Shaw, Lyndhurst; Ernest C. Milberger, Solon, and Serge R. Dolhyj, Parma, all of Ohio, assignors to The Standard Oil Company (Ohio), Cleveland, Ohio

Filed Jun. 1, 1976, Ser. No. 691,691
Int. Cl.³ B01J *23/10, 23/22, 23/28, 27/18*
U.S. Cl. 252—437 **3 Claims**

1. A catalyst having the empirical formula:

$$Mo_aV_bW_cLa_dX_eO_f$$

wherein

X is one or more of the elements selected from the group consisting of manganese, iron, copper, zinc, aluminum, cobalt, nickel, phosphorus, cadmium, bismuth, silver, niobium, arsenic, chromium, and the alkali and the alkaline earth elements; and

wherein

the number of atoms of each element present i represented by a–f;

wherein

a is a number from 6–18;
b is a number from 0.1–10;
c is a number from 0.1–6;
d is a number from 0.01–5;
e is a number greater than 0, up to 5;
f is a number that has satisfied the valence requirements of the other elements present; and wherein the catalyst does not contain cerium.

4,250,055
ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

John F. Flagg, Rosemont, and George J. Antos, Bartlett, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 928,650, Jul. 27, 1978, Pat. No. 4,179,360.
This application Jun. 11, 1979, Ser. No. 47,605
The portion of the term of this patent subsequent to Mar. 25, 1997, has been disclaimed.
Int. Cl.³ B01J *27/08, 27/10*
U.S. Cl. 252—441 **12 Claims**

1. An acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.05 to about 5 wt. % nickel, about 0.1 to about 10 wt. % uranium, and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group, catalytically available nickel, and uranium components are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group component is present in the elemental metallic state; wherein substantially all of the uranium component is present in an oxidation state above that of the elemental metal; and wherein substantially all of the catalytically available nickel component is present in the elemental metallic state or in a state which is reducible to the elemental metallic state, or in a mixture of these states.

4,250,056
CATALYSTS FOR HYDROREFORMING

Jean-Francois Le Page, Rueil-Malmaison; Germain Martino, Poissy, and Jean Miquel, Paris, all of France, assignors to Societe Francaise des Produits pour Catalyse, Rueil-Malmaison, France

Division of Ser. No. 858,971, Dec. 9, 1977, Pat. No. 4,214,980.
This application Jan. 15, 1980, Ser. No. 112,260
Claims priority, application France, Dec. 9, 1976, 76 37413
Int. Cl.³ B01J *21/04, 23/62, 23/64, 27/08*
U.S. Cl. 252—441 **17 Claims**

1. A catalyst comprising an alumina carrier and, expressed by weight with respect to alumina:

(a) from 0.05 to 0.6% of platinum,
(b) from 0.01 to 2% of rhenium,
(c) from 0.05 to 3% of thallium or indium, and
(d) from 0.1 to 10% of halogen.

4,250,057
PROCESS FOR PRODUCING A CATALYST COMPRISING A GRAPHITE CONTAINING CARBON, A TRANSITIONAL METAL AND A MODIFYING METAL ION

Alan I. Foster, Ashford; Peter G. James, Sunbury-on-Thames; John J. McCarroll, Camberley, and Stephen R. Tennison, Weybridge, all of England, assignors to The British Petroleum Company Limited, Sunbury on Thames, England

Division of Ser. No. 847,075, Oct. 31, 1971, Pat. No. 4,163,775.
This application Oct. 6, 1978, Ser. No. 949,078
Claims priority, application United Kingdom, Nov. 3, 1976, 45711/76
Int. Cl.³ B01J *23/58, 21/18;* **C01C** *1/04*
U.S. Cl. 252—447 **5 Claims**

1. A method for the preparation of a catalyst comprising the steps of impregnating a graphite-containing carbon having (a) a basal plane surface area of at least 100 m^2/g, (b) a ratio of BET surface area to basal plane surface of not more than 8:1, and (c) a ratio of basal plane surface area to edge surface area of at least 2:1 with a solution of a ruthenium compound to give a metal content of 0.1 to 50% by weight thereto, and a solution of a modifying metal ion selected from the group consisting of potassium, rubidium and barium to give a modifying metal ion concentration of 0.1 to 4 times by weight of the transition metal thereto, said impregnations of said graphite-containing carbon being on a sequential basis and with said impregnated graphite-containing carbon being reduced after at least the ruthenium impregnation to reduce the ruthenium compound present therein.

5. The product of the process as defined in claim **1**.

4,250,058
METHOD OF PREPARING SPHEROIDAL ALUMINA PARTICLES

Edward Michalko, Hemet, Calif., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 884,291, Mar. 6, 1978, abandoned. This application May 17, 1979, Ser. No. 39,975
The portion of the term of this patent subsequent to Nov. 19, 1996, has been disclaimed.
Int. Cl.³ B01J *21/04, 37/00;* **B01F** *7/02*
U.S. Cl. 252—448 **7 Claims**

1. A method of preparing spheroidal alumina particles which comprises:

(a) commingling an acidic alumina hydrosol with an ammonia precursor at below gelation temperature;
(b) dispersing the mixture as droplets in a hot oil bath at a temperature effecting decomposition of said ammonia precursor and gelation of said hydrosol;
(c) aging the resulting hydrogel spheres in said oil bath at about atmospheric pressure conditions and at a temperature of from about 95° to about 105° C. until said spheres achieve a pH in excess of 6 to about 7.5;
(d) thereafter displacing said oil bath with an ammonium salt-buffered aqueous ammoniacal solution containing from about 0.5 to about 10 wt.% ammonium salt and from about 0.1 to about 1 wt.% ammonia, and retaining the spheres in said solution for at least about 15 minutes;
(e) separating and further aging the hydrogel spheres in an aqueous ammoniacal solution containing from about 0.5 to about 3 wt.% ammonia for a period of from about 1 to about 24 hours; and,
(f) water-washing, drying and calcining the spheroidal alumina product.

4,250,059

CATALYTIC COMPOSITE, METHOD OF MANUFACTURE

Hosheng Tu, Shorewood, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 27, 1979, Ser. No. 69,684
Int. Cl.[3] B01J 29/18
U.S. Cl. 252—455 Z 20 Claims

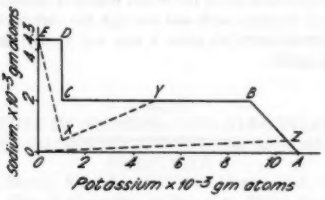
1. A method of preparing a catalytic composite which comprises calcining a zeolite of the mordenite crystal structure containing less than about 5 wt. % sodium as Na_2O, in admixture with a refractory inorganic oxide and an ammonium salt selected from the group consisting of ammonium chloride, sulfate and phosphate.

4,250,060

GAS MAKING CALCINED CATALYST PRECURSORS OF NICKEL, ALUMINA, SODIUM AND POTASSIUM

Reginald G. S. Banks, and Alan Williams, both of Solihull, England, assignors to British Gas Corporation, London, England

Continuation of Ser. No. 930,815, Aug. 3, 1978, abandoned, which is a division of Ser. No. 704,410, Jul. 12, 1976, Pat. No. 4,105,591. This application Jun. 18, 1979, Ser. No. 49,601
Claims priority, application United Kingdom, Sep. 29, 1975, 39724/75
Int. Cl.[3] B01J 21/04, 23/78
U.S. Cl. 252—466 J 5 Claims



1. A catalyst precursor which when reduced will produce a catalyst which is resistant to deactivation by polymer formation or by sintering and is therefore advantageously suitable for reforming hydrocarbons with steam at high pressures to produce methane-containing gases, said catalyst precursor consisting essentially of a calcined mixture of nickel, alumina, sodium and potassium, said catalyst precursor having been formed by co-precipitation from water solution utilizing sodium or potassium precipitants in the essential absence of chemical species having a deleterious effect upon the performance of the catalyst, wherein the nickel content in the catalyst precursor ranges from 50 to 65% by weight of the total weight of the catalyst precursor and wherein

(1) the total combined weight of sodium and potassium does not exceed 0.011 gm atoms/100 gm of catalyst precursor,

(2) at combined sodium and potassium contents of up to 0.05% by weight of the catalyst precursor, the water loss is not more than 11.2, and

(3) the ratio of sodium to potassium, expressed as a gram atom percentage, is

$$\frac{30 - 10Na}{70 - 90\,K}.$$

4,250,061

2-ACETYL-1,3,3,4,4-PENTAMETHYLCYCLOPENTENE AS A FRAGRANCE MATERIAL

Alan R. Hochstetler; Glen R. Fredericks, both of Clifton, N.J., and Erlinda F. Golle, Bronx, N.Y., assignors to Givaudan Corporation, Clifton, N.J.

Continuation-in-part of Ser. No. 935,443, Aug. 21, 1978, abandoned. This application Jun. 18, 1979, Ser. No. 49,833
Int. Cl.[3] A61K 7/46
U.S. Cl. 252—522 R 17 Claims

1. A method for improving the odor of fragrance compositions which comprises adding thereto an amount of 2-acetyl-1,3,3,4,4-pentamethylcyclopentene sufficient to put its concentration in the fragrance base between 0.01% and 30% of the fragrance base.

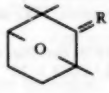
4,250,062

1,4-EPOXY-1,3,3-TRIMETHYL-2-(2-BUTEN-1-YLIDENE) CYCLOHEXANES AS ODORANTS

Roman Kaiser, Uster, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.

Division of Ser. No. 924,030, Jul. 12, 1978, Pat. No. 4,225,501. This application Aug. 14, 1979, Ser. No. 66,359
Claims priority, application Luxembourg, Jul. 25, 1977, 77834; Switzerland, May 19, 1978, 5464/78
Int. Cl.[3] C11B 9/00
U.S. Cl. 252—522 R 4 Claims

1. An odorant composition comprising an effective amount of a compound of the general formula



I

wherein R represents the 2-cis or the 2-trans-buten-1-ylidene group and at least one other odorant with the exception of natural mixtures containing a compound of formula I.

4,250,063

METHOD FOR CHAIN-OPENING POLYMERIZATION OF NORBORNENE DERIVATIVES

Teizo Kotani; Shuichi Matsumoto; Katsutoshi Igarashi, and Kazuo Suzuki, all of Yokohama, Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 815,320, Jul. 13, 1977, abandoned. This application Jan. 22, 1979, Ser. No. 5,503
Claims priority, application Japan, Jul. 13, 1976, 51-82573; Sep. 14, 1976, 51-109413
Int. Cl.[3] C08F 4/16, 4/22, 18/00
U.S. Cl. 260—4 R 19 Claims

1. A process for producing a polymer or copolymer of a norbornene derivative, which comprises contacting in the presence or absence of an inert solvent at least one norbornene derivative substituted by at least one polar group selected from the group consisting of ester, ether, nitrile, amide, imide, acid anhydride, halogen, and silyl, or by at least one substituent having said polar group; or a combination of said norbornene derivative with at least one member selected from the group consisting of cycloalkenes having no polar substituent and polymers having olefinic carbon-to-carbon double bonds, with a catalyst comprising (a) at least one coordination compound of W or Mo, the oxidation number of which is 2,1, or 0, (b) at least one titanium tetrahalide, and (c) at least one compound selected from the group consisting of N-halogen-substituted cyclic acid imides, sulfides, sulfoxides and phosphines.

4,250,064

PLASTIC FORMULATION REINFORCED WITH ORGANIC FIBERS

Herman Chandler, Newburgh, N.Y., assignor to GAF Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 739,075, Nov. 5, 1976, abandoned, which is a continuation-in-part of Ser. No. 537,788, Dec. 31, 1974, Pat. No. 3,991,006. This application Jun. 5, 1978, Ser. No. 912,498

The portion of the term of this patent subsequent to Nov. 9, 1993, has been disclaimed.

Int. Cl.[3] C08K *3/26;* C08L *1/00*

U.S. Cl. 260—17.4 CL 49 Claims

1. A plastic formulation suitable for the manufacture of tile and the like, said formulation being essentially free of asbestos and comprising an intimate mixture of:

(a) plasticized, normally solid resin selected from the group consisting of vinyl chloride/vinyl C_2–C_4 alkanoate copolymer, vinylidine chloride/vinyl chloride copolymer, vinyl chloride/propylene copolymer, hydrocarbon resins, chlorinated polyethylene and mixtures thereof;

(b) an organic fibrous filler not easily dispersed in said formulation, said organic filler having specific gravity between about 1 and about 1.5.

(c) between about 20 and 50 wt% based on total formulation of particulate filler of a particle size less than 20 microns; and

(d) between about 20 and about 60 wt% based on total formulation of particulate filler of a particle size between about 20 and about 200 mesh.

4,250,065

FLAME RETARDANT NYLON HAVING IMPROVED MOLDABILITY

Richard E. Phillips, Jr., Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

Filed Jun. 6, 1979, Ser. No. 46,391

Int. Cl.[3] C08J *3/20*

U.S. Cl. 260—18 N 10 Claims

1. A composition of matter having good flame retardant and mold release characteristics and improved moldability comprising a nylon polyamide; 500–5000 ppm each of C_{12}-C_{20} aliphatic alcohol and an aluminum salt of a C_{12}-C_{20} fatty acid such that the ratio of the parts of salt to the parts of alcohol is at least about 1; and 100–600 ppm of a zinc salt of a C_{12}-C_{20} fatty acid, provided the amount of zinc salt is from about 5 to about 30 percent by weight of the aliphatic alcohol.

4,250,066

MODIFIED PHENOLIC RESINATES AND INKS

Rupert J. Schefbauer, Hasbrouck Heights, N.J., assignor to Inmont Corporation, New York, N.Y.

Filed Jan. 7, 1980, Ser. No. 110,269

Int. Cl.[3] C08L *93/04*

U.S. Cl. 260—25 10 Claims

1. A calcium resinate comprising the reaction product of calcium hydroxide with:

(a) a rosin modified phenol formaldehyde condensate and

(b) an α-olefin-maleic anhydride partial ester or polyanhydride.

4,250,067

COPOLYMER-OIL BLENDS STABILIZED WITH ASPHALT

Clarence R. Bresson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 25, 1978, Ser. No. 928,037

Int. Cl.[3] C08L *91/00*

U.S. Cl. 260—28.5 AS 9 Claims

1. A method for hot melt blending a stabilized composition of rubbery polymer and extender oil said method comprising:

(a) dissolving a stabilizing amount of of asphalt in said extender oil to produce a first blend, said stabilizing amount in the range of about 5 to about 15 percent by weight of the total composition, and then

(b) dissolving rubbery polymer in said first blend.

4,250,068

COMPOSITION FOR COATING GLASS CONTAINERS

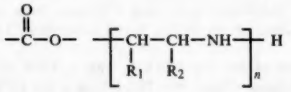
Syed R. Ali-Zaidi, Shippenville, Pa., assignor to Glass Containers Corporation, Fullerton, Calif.

Division of Ser. No. 905,898, May 15, 1978. This application Aug. 22, 1979, Ser. No. 68,541

Int. Cl.[3] C08L *91/00*

U.S. Cl. 260—28.5 R 5 Claims

1. A coating composition for improving the abrasion resistance and lubricity of glass containers, and having good adhesion thereto, comprising an aqueous mixture of a polyaminoacrylate ester, which is an acidified aminoethylated copolymer having pendant aminoalkylate groups of the formula:



wherein R_1 and R_2 are independently selected from the group consisting of hydrogen and lower alkyl radicals having 1 to 4 carbon atoms and the average value of n ranges from about 1.0 to 2.5 and wherein the copolymer before aminoethylation contains at least 3 percent by weight pendant —COOH groups; and a crosslinking agent therefore, which crosslinking agent is capable of reaction with and through the carboxyl groups of said polyaminoacrylate ester; a wax and a vinyl amino silane coupling agent.

4,250,069

MODIFIED MELAMINE-FORMALDEHYDE CONDENSATION PRODUCTS

Raymond W. Yates, Walsall, England, assignor to British Industrial Plastics, Limited, Manchester, England

Filed Jun. 19, 1979, Ser. No. 49,892

Claims priority, application United Kingdom, Jun. 24, 1978, 27825/78

Int. Cl.[3] C08G *12/12, 12/32*

U.S. Cl. 260—29.4 R 10 Claims

1. A method of making a cationic water-soluble melamine-urea-aliphatic hydroxymonoamine-formaldehyde resin comprising reacting formaldehyde and an aliphatic hydroxymonoamine at elevated temperature in an aqueous medium of pH at least 8.5 and of solids content at least 60% to obtain a first product which is an aliphatic hydroxymonoamine-formaldehyde condensate; and then reacting that condensate with melamine and urea at elevated temperature to obtain a final product, at least the final stage of the latter reaction being carried out at reduced pH in the range 6.5–8.5: the proportions of the various reactants employed being such as to produce a final product in which the molar ratios melamine:urea:aliphatic hydroxymonoamine:formaldehyde are 1:1.5–8.0:0.5–2.5:4–24, and the molar ratio formaldehyde: each amino-hydrogen atom is in the range 0.5–1.25:1.

4,250,070

AQUEOUS DISPERSIONS, CONTAINING HYDRAZINE DERIVATIVES, OF CARBONYL-CONTAINING COPOLYMERS

Gregor Ley, Wattenheim; Erich Penzel, Ludwigshafen; Walter Rebafka, Eppelheim, and Kaspar Bott, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 16, 1979, Ser. No. 3,965

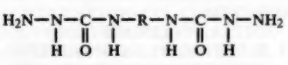
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1978, 2803258

Int. Cl.³ C08L *25/18, 29/12, 29/00*

U.S. Cl. 260—29.6 MM **2 Claims**

1. An aqueous dispersion of a copolymer of olefinically unsaturated monomers containing keto and/or aldehyde

groups, which dispersion contains as a crosslinking agent for the keto and/or aldehyde groups of the copolymer from 0.02 to 1 mole of an organic hydrazine derivative from the group consisting of dihydrazides of aliphatic dicarboxylic acids of 2 to 10 carbon atoms and bis-semi-carbazides of the general formula



in which R is an aliphatic radical of 2 to 7 carbon atoms or a carbocyclic radical of 6 to 8 carbon atoms, and from 0.0002 to 0.02 mole of heavy metal ions per mole of the hydrazine derivative.

4,250,071

MIXTURE OF AMMONIA AND ALKOXYLATED POLY-SILOXANES AND ITS USE AS A HEAT SENSITIZER

Hermann Perrey, Krefeld, and Martin Matner, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

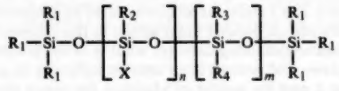
Filed Dec. 13, 1978, Ser. No. 969,100

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1977, 2756774

Int. Cl.³ C08K *5/54*

U.S. Cl. 260—29.7 NR **6 Claims**

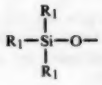
1. A mixture consisting of ammonia and alkoxylated polysiloxanes corresponding to the formula



in which the formula represents the gross composition of a linear, statistically distributed copolymer of n parts of

and m parts of

units with terminal



groups and in which

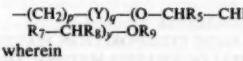
R_1, R_2 and R_3 independently of one another represent an unsubstituted or halogen substituted C_1–C_{10}-alkyl or aryl,

R_4 represents hydrogen or a C_1–C_{10}-alkyl or aryl unsubstituted or substituted by halogen,

n is a number from 1 to 50,

m is a number from 0 to 50,

X represents

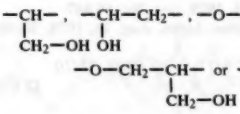


wherein

p is a number from 1 to 8 and

q is 0 or the number 1,

Y represents

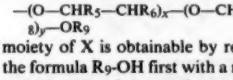


R_5, R_6, and R_7 are hydrogen,

R_8 is methyl,

R_9 represents an alkyl moiety of a lower alcohol and

x and y are numbers from 5 to 100 characterized in that the



moiety of X is obtainable by reacting a lower alcohol of the formula R_9-OH first with a mixture of propylene oxide and 80–90% of the total amount of ethylene oxide and subsequently reacting the remaining 10–20% ethylene oxide.

4,250,072

RADIOPAQUE POLYURETHANE RESIN COMPOSITIONS

Vincent J. Flynn, 130 New Rd., Apt. D10, Parsippany, N.J. 07054

Continuation-in-part of Ser. No. 862,773, Dec. 21, 1977, abandoned, which is a continuation of Ser. No. 712,189, Aug. 6, 1976, abandoned. This application May 18, 1979, Ser. No. 40,278

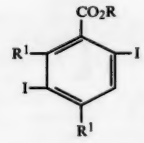
Int. Cl.³ C08K *5/09, 5/10*

U.S. Cl. 260—31.2 N **5 Claims**

1. A radiopaque composition comprising

(a) a resin which includes from 100 to 33 parts by weight of a thermoplastic polyurethane and from 0 to 67 parts of a polymer of a halogenated vinyl monomer; and

(b) a radiopacifier therefor consisting of a diiodobenzoate or a tetraiodobenzoate compound of the formula



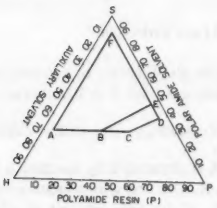
wherein R^1 is hydrogen or iodo, and R is alkyl or alkoxyalkyl or a mixture of said compounds, said radiopacifier or comprising 10 to 40 parts by weight per 100 parts by weight of (a) and (b).

4,250,073

AROMATIC POLYAMIDE COMPOSITION HAVING POLAR AMIDE AND HALOGENATED HYDROCARBON MIXED SOLVENT

Yorikazu Tamura; Akihiro Aoki; Hiroshi Mera, and Keizo Shimada, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Aug. 14, 1979, Ser. No. 66,447
Claims priority, application Japan, Aug. 16, 1978, 53-98986; Jun. 26, 1979, 54-79611
Int. Cl.[3] C08K 5/17, 5/20; C08L 77/10
U.S. Cl. 260—32.6 NA 13 Claims



1. An aromatic polyamide composition comprising the components of:

a polymer resin (P) consisting of at least one aromatic polyamide;

a polar solvent (S) consisting of at least one organic amide compound;

an auxiliary solvent (H) consisting of at least one halogenated hydrocarbon, and;

a solubility-enhancing agent consisting of at least one inorganic halide, selected from the group consisting of alkali metal halides, alkaline earth metal halides and ammonium halides, in an amount of from 5 to 60% based on the weight of said polymer resin component, the proportions by weight of said polymer resin component (P), said polar solvent component (S) and said auxiliary solvent component (H) in said composition being on or within a quadrilateral, in a triangular composition diagram, defined by the co-ordinates A, C, D and F:

A (P 5.0, S 30.0, H 65.0)
C (P 45.0, S 30.0, H 25.0)
D (P 57.0, S 38.0, H 5.0) and
F (P 5.0, S 90.0, H 5.0).

4,250,074

INTERPENETRATING POLYMER NETWORK COMPRISING EPOXY POLYMER AND POLYSILOXANE

Raymond E. Foscante, Yorba Linda; Albert P. Gysegem, Monrovia; Pamela J. Martinich, Long Beach, and Gabriel H. Law, Rancho Palos Verdes, all of Calif., assignors to Ameron, Inc., Monterey Park, Calif.

Continuation-in-part of Ser. No. 953,920, Oct. 23, 1978, abandoned. This application Sep. 6, 1979, Ser. No. 72,897
Int. Cl.[3] C08G 77/26; C08L 63/00, 83/06
U.S. Cl. 260—32.8 EP 63 Claims

1. A method for preparing an interpenetrating polymer network having an epoxy network intertwined with a polysiloxane network comprising the steps of:

(a) mixing a silane with an epoxy resin having at least two oxirane groups per molecular, the silane being selected from the group consisting of aminosilane, epoxysilane, alkoxysilane, alkyltrialkoxysilane, aryltrialkoxysilane, and hydrolytic polycondensation products thereof;

(b) distributing water substantially uniformly throughout the mixture in an amount sufficient to bring about substantial hydrolytic polycondensation of the silane to form a polysiloxane network; and

(c) substantially simultaneously reacting the epoxy resin with an amine curing agent to form a polymerized epoxy resin network intertwined with the polysiloxane network.

4,250,075

ELECTRICALLY CONDUCTIVE POLYDIORGANOSILOXANES

Carl M. Monroe, and Randall P. Sweet, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Feb. 5, 1979, Ser. No. 9,219
Int. Cl.[3] C08L 83/06; C08K 5/02
U.S. Cl. 260—33.6 SB 7 Claims

1. An electrically conductive composition having improved electrical life when subjected to high voltage electrical impulses consisting essentially of a curable vinyldiorganosiloxy endblocked polydiorganosiloxane, the organic radicals being selected from the group consisting of methyl, ethyl, phenyl, and 3,3,3-trifluoropropyl radicals, there being from 0 to 50 inclusive percent 3,3,3-trifluoropropyl radicals and from 0 to 50 inclusive percent phenyl radicals, all percentages of radicals being based on the total number of organic radicals in the polydiorganosiloxane,

greater than 15 percent by weight, based on the weight of the composition, of carbonaceous particles of less than 20 micrometers average diameter, a crosslinking agent consisting of a polyorganohydrogensiloxane having an average of at least 2.1 silicon-bonded hydrogen atoms per molecule, said molecules consisting essentially of units selected from the group consisting of $H(CH_3)SiO$ units; R_2SiO units; $H(CH_3)_2SiO_{\frac{1}{2}}$ units, $R_3SiO_{\frac{1}{2}}$ units, and SiO_2 units, R being selected from the group consisting of alkyl radicals having from 1 to 6 carbon atoms inclusive, phenyl radicals, and 3,3,3-trifluoropropyl radicals, the amount of polyorganohydrogensiloxane being sufficient to provide from 1.2 to 3 inclusive silicon-bonded hydrogen atoms for every silicon-bonded vinyl group in the composition,

a platinum-containing catalyst, soluble in the polydiorganosiloxane, and present in an amount sufficient to provide at least 1 part by weight of platinum for every one million parts by weight of the polydiorganosiloxane,

an amount of a platinum catalyst inhibitor sufficient to give the desired shelf life, and optionally a phenyl-containing polysiloxane, the composition further restricted in that there must be present greater than 2 percent by weight of phenyl radicals based on the weight of the cured composition, said phenyl radical being present in either the vinyldiorganosiloxy endblocked polydiorganosiloxane, the crosslinking agent, or phenyl-containing polysiloxane separately or in combination.

4,250,076

FOUNDRY MOLDING COMPOSITIONS

Ronald Golden, Louisville, Ky.; Matthew S. Kulaga, New Albany, and Stephen Shatynski, Floyd Knobs, both of Ind., assignors to Borden, Inc., Columbus, Ohio

Filed May 14, 1979, Ser. No. 38,801
Int. Cl.[3] C08K 3/36
U.S. Cl. 260—38 6 Claims

1. A foundry composition comprising sand, from about 1% to 10%, based on the weight of said sand, of a phenol-formaldehyde binder resin to bind the sand particles together, and a sufficient amount of an additive to improve heat distortion properties of articles made from such composition, the additive being selected from partially alkylated phenol-formaldehyde novolac resins wherein the alkylating groups are selected from alkyl radicals containing 1 to 22 carbon atoms, alkene radicals containing 3 to 22 carbon atoms, alkylbenzene groups containing 8 to 12 carbon atoms, saturated or unsaturated alicyclic groups containing 6 to 20 carbon atoms, and mixtures thereof and said alkylated resins are selected from the group consisting of ortho alkyl, para alkyl and ortho and para dialkyl-substituted phenol-formaldehyde novolac resins and mixtures thereof.

4,250,077

STABLE SUSPENSIONS OF INORGANIC FILLERS IN ORGANIC POLYHYDROXYL COMPOUNDS FOR POLYURETHANE PREPARATION

Wulf von Bonin, Leverkusen, and Peter Vehlewald, Leichlingen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 936,673, Aug. 24, 1978, Pat. No. 4,198,333. This application Sep. 27, 1979, Ser. No. 79,295
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1977, 2739620
Int. Cl.[3] C08G 18/63
U.S. Cl. 260—37 N 1 Claim

1. In a method of preparing polyurethane plastics from polyisocyanates and a suspension which is stable in storage comprising:

(1) 0.5 to 80%, by weight, based on the total suspension, of an inorganic filler in

(2) 20 to 99.5%, by weight, based on the total suspension, of polyhydroxyl compounds containing aliphatic or cycloaliphatic combined hydroxyl groups,

wherein said polyhydroxyl compounds (2) contain from 0.05 to 10%, by weight, based on (1)+(2) of a graft polymer and stabilizer which was produced by the free-radical polymerization of

(a) from 1 to 35%, by weight, based on the graft polymer, of an olefinically unsaturated carboxylic acid and

(b) from 0 to 60%, by weight, based on the graft polymer, of other olefinically unsaturated monomers, in the presence of

(c) from 5 to 99%, by weight, based on the graft polymer, of polyhydroxyl compounds, the

improvement wherein the carboxyl groups of the graft polymer are completely or partially neutralized by organic or inorganic bases.

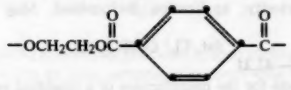
4,250,078

THERMOPLASTIC POLYESTER MOLDING COMPOSITIONS

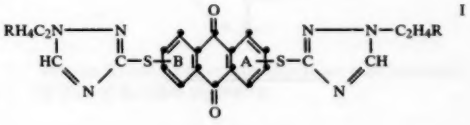
Finley E. McFarlane, and Robert B. Taylor, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 19, 1979, Ser. No. 21,755
Int. Cl.[3] C08K 3/22
U.S. Cl. 260—40 R 4 Claims

1. Polyester molding composition selected from (a) polymers wherein at least about 97% by weight of the polymer contains the repeating ethylene terephthalate units of the formula:

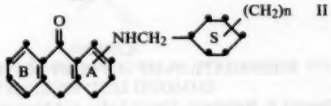


with the remainder being minor amounts of ester-forming components, and (b) copolymers of ethylene terephthalate wherein up to about 30 mole percent of the glycol is selected from one or more of diethylene glycol; propane-1,3-diol; butane-1,4-diol; polytetramethylene glycol; polyethylene glycol; polypropylene glycol and 1,4-hydroxymethylcyclohexane; and up to about 30 mole percent of the acid is selected from one or more of isophthalic; bibenzoic; naphthalene 1,4- or 2,6-dicarboxylic, adipic; sebacic; and decane-1,10-dicarboxylic acid, and (c) said polymers containing a coloring amount of the copolymerized residue of one or more compounds of the formula



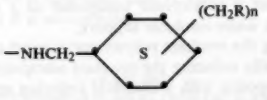
I

and



II

wherein R is —OH, —COOR[1] or —COX wherein R[1] is —H or lower alkyl, X is halogen, n is 1 or 2, either A or B of II must contain, and A or B of I may contain, at least one additional



group, each of rings A and B may be further substituted with 1-3 radicals selected from lower alkyl which may be substituted with lower alkoxy, phenyl, Cl, Br, and lower alkanoylamino; lower alkoxy which may be substituted with lower alkoxy, phenyl, Cl, Br, and lower alkanoylamino; chlorine; bromine; amino; lower alkyl amino which may be substituted with lower alkoxy, cyclohexyl, phenyl, Cl, Br, and lower alkanoylamino; aryl amino; arylthio, and aroylamino; wherein each aryl is 6-10 carbons; lower alkylsulfonyl; lower alkylthio; lower alkanoylamino; and cyclohexylamino; wherein said polymers are admixed with from about 1 to about 300 ppm of iron oxide.

4,250,079

PROCESS FOR THE MANUFACTURE OF A PERYLENE-3,4,9,10-TETRACARBOXYLIC DIANHYDRIDE PIGMENT WITH IMPROVED PROPERTIES

Fridolin Bäbler, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 10, 1979, Ser. No. 37,600

Claims priority, application Switzerland, May 18, 1978, 5389/78

Int. Cl.[3] C08K 5/00

U.S. Cl. 260—42.21 13 Claims

1. A process for the manufacture of a modified perylenetetracarboxylic acid pigment composition, having extremely good dispersibility and a small portion of imide groups present in the pigment, which process comprises

(a) adding 0.01 to 0.2 moles of at least one primary aliphatic or cycloaliphatic amine having at least 12 carbon atoms, per each mole of perylenetetracarboxylic acid to an aqueous alkaline solution of an alkali metal salt or ammonium salt of perylenetetracarboxylic acid,

(b) acidifying the reaction mixture to precipitate free perylenetetracarboxylic acid at a temperature between 0° and 100° C.,

(c) heating the reaction mixture to reflux to convert the acid to the corresponding anhydride, and

(d) isolating the pigment composition.

3. A pigmented composition which comprises (a) a high molecular weight polymer; and (b) an effective amount of a pigment composition according to claim 1.

4,250,080

PREPARATION OF SUPPORT MATRICES FOR IMMOBILIZED ENZYMES

Ronald P. Rohrbach, Forest Lake, and George W. Lester, Hoffman Estates, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 951,947, Oct. 16, 1978. This application Nov. 7, 1979, Ser. No. 91,928

Int. Cl.[3] C08K 3/00

U.S. Cl. 260—42.46 6 Claims

1. A process for the preparation of an organic-inorganic support matrix having pendent bonding sites for enzymatic conjugates which comprises:

(a) adsorbing a polystyrene compound on a solid porous inorganic water-insoluble support;

(b) nitrating the resultant polystyrene-support composite;

(c) chemically reducing the resultant nitropolystyrene-support composite with a chemical reducing agent to form aminopolystyrene;

(d) contacting said reduced aminopolystyrene adsorbed support of step (c) with a bifunctional monomer comprising an organic compound containing a moiety selected from the group consisting of acyl, isocyanato, and carbonyl moieties in a molar excess fo from about 2 to about 50 mole proportions of bifunctional monomer relative to the amino of the aminopolystyrene composite formed in step (c) to provide pendent bonding sites for enzymatic conjugate attachment thereto; and

(e) recovering said organic-inorganic support matrix having said pendent bonding sites for enzymatic conjugate attachment thereto.

4,250,081

THERMOPLASTIC MIXTURES FOR THE PRODUCTION OF SYNTHETIC RESIN FILMS WITH ANTIBLOCKING PROPERTIES COMPRISING A THERMOPLASTIC SYNTHETIC RESIN AND A PULVERULENT ZEOLITE

Rudolf Bode, Bad Orb; Arthur Reisert, Kahl; Günter Türk, Hanau, and Hans Strack, Alzenau, all of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Hanau, Fed. Rep. of Germany

Filed Jul. 24, 1979, Ser. No. 60,127

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1978, 2833675

Int. Cl.[3] C08L 23/02

U.S. Cl. 260—42.46 29 Claims

1. A thermoplastic mixture suitable for the production of a synthetic resin film having antiblocking properties comprising a thermoplastic synthetic resin and 0.05 to 70 weight % of the composition of a pulverulent zeolite.

4,250,082

PROCESS FOR THE PREPARATION OF A PULVERULENT FILLED RUBBER

Neithart Sommer; Karl-Heinz Nordsiek, and Jürgen Ehrlich, all of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed May 14, 1979, Ser. No. 38,752

Claims priority, application Fed. Rep. of Germany, May 20, 1978, 2822148

Int. Cl.[3] C08J 3/20

U.S. Cl. 260—42.55 8 Claims

1. A process for the precipitation of a pulverulent filled rubber, which consists essentially of mixing

(a) a rubber latex;

(b) a rubber solution; or

(c) a rubber emulsion;

with a filler suspension, waterglass and a water-soluble aluminum salt at a predetermined pH value of 3.0–3.7, the pH value being kept constant by introduction of acid during the precipitation,

whereby the intermediate preparation of a stable mixture of (a), (b) or (c) with the filler suspension is avoided.

4,250,083

VISCOSITY STABILIZED CHLOROPRENE-SULFUR COPOLYMERS

Gaylon T. Click, Pearland; Nathan L. Turner, Humble, and Edwin F. Hoff, Jr., Pasadena, all of Tex., assignors to Denka Chemical Corporation, Houston, Tex.

Filed Feb. 5, 1979, Ser. No. 9,109

Int. Cl.[3] C08K 5/18

U.S. Cl. 260—45.9 QB 3 Claims

1. A process for preparing chloroprene-sulfur copolymers having improved viscosity stability comprising

polymerizing chloroprene and from 0.2 to 0.8 parts of sulfur by weight per hundred parts of monomer in an aqueous emulsion in the presence of a catalyst consisting essentially of organic or inorganic peroxides and about 0.25 to 0.75 parts by weight of a styrenated diphenyl amine per hundred parts of monomer at a temperature in the range of 15° to 55° C. to a desired conversion,

peptizing the product of the polymerization and,

recovering a product copolymer having a reduced and stabilized viscosity.

4,250,084

PURIFIED THYMIC HORMONE (THF), ITS PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING IT

Nathan Trainin, Rehovot, Israel, assignor to Yeda Research and Development Company Limited, Rehovot, Israel

Continuation of Ser. No. 700,238, Jun. 28, 1976, abandoned. This application Sep. 18, 1978, Ser. No. 942,722

Claims priority, application Israel, Jul. 4, 1975, 47645

Int. Cl.[3] C07G *7/00;* A61K *37/02*

U.S. Cl. 260—112 R **9 Claims**

1. A THF active composition having a molecular weight of 3323±220; an isoelectric point of from 5.7 to 5.9; an amino acid composition of approximately: aspartic acid—4 units; threonine—1 unit; serine—5 units; glutamic acid—8 units; proline—2 units; glycine—5 units; alanine—2 units; leucine—1 unit; lysine—1 unit; arginine—2 units; ½ cystine—1 to 2 units; being the product obtainable by purification of thymus tissue and removal therefrom of endotoxins.

4,250,085

ACYL DERIVATIVES

Frank R. Atherton, Welwyn Garden City; Michael J. Hall, Welwyn; Cedric H. Hassall, Welwyn; Robert W. Lambert, Welwyn, and Peter S. Ringrose, Harston, all of England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

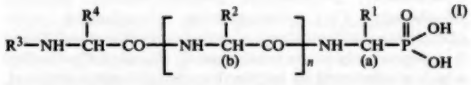
Filed Dec. 20, 1978, Ser. No. 971,156

Claims priority, application United Kingdom, Dec. 23, 1977, 53668/77; Nov. 20, 1978, 45272/78

Int. Cl.[3] C07C *103/52;* C07G *7/00;* A61K *37/00*

U.S. Cl. 260—112.5 R **15 Claims**

1. Compounds of the general formula



(I)

wherein R^1 represents a hydrogen atom or the methyl or hydroxymethyl group or a mono-, di- or trihalomethyl group; R^2 represents the characterising group of an α-amino acid of the type normally found in proteins or a lower alkyl or hydroxy-(lower alkyl) group other than the characterising group of an α-amino acid of the type normally found in proteins; R^3 represents a lower alkyl, lower cycloalkyl, or lower alkenyl; R^4 represents a hydrogen atom or a lower alkyl group; n stands for 1, 2 and 3; the configuration at the carbon atom designated as (a) is (R) when R^1 represents other than a hydrogen atom; and the configuration at the carbon atom designated as (b) is (L) when R^2 represents other than a hydrogen atom, and pharmaceutically acceptable salts thereof.

4,250,086

METHOD AND COMPOSITION FOR PREPARATION OF H-SAR-LYS-SAR-GLN-NH$_2$

George Heavner, Flemington, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Continuation-in-part of Ser. No. 33,641, Apr. 26, 1979. This application Nov. 19, 1979, Ser. No. 95,744

Int. Cl.[3] C07C *103/52*

U.S. Cl. 260—112.5 R **24 Claims**

1. The dipeptide of formula Z-SAR-ε-Z'-LYS-OH, wherein Z and Z' are each selected from the group consisting of

(a)

wherein R_1 ia phenyl; tolyl; xylyl; adamantyl; allyl; β-cyanoethyl; fluorenylmethyl; benzyl, benzyl wherein the phenyl ring is substituted with from one to three members selected from halo, nitro, loweralkyl, and loweralkoxy; diisopropylmethyl; diphenylmethyl; cyclohexyl; cyclopentyl; vinyl; t-butyl; t-amyl; dimethyltrifluoromethylmethyl; or dimethylbiphenylmethyl;

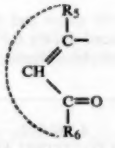
(b)

wherein R_2 is loweralkyl of two to four carbons or loweralkyl of one to four carbons substituted with from one to five halo groups;

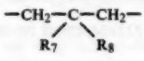
(c)

wherein X is S or O and R_3 and R_4 are each benzyl or loweralkyl;

(d)

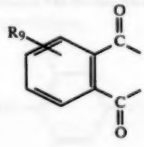


wherein R_5 and R_6 taken individually are each loweralkyl or R_5 and R_6 taken together is



wherein R_7 and R_8 are each hydrogen or loweralkyl; and

(e)



wherein R_9 is hydrogen, methyl, halo, or nitro provided that Z is monodentate.

4,250,087

CARBOXYL TERMINUS ANALOGS OF β-ENDORPHIN

Choh H. Li, Berkeley, Calif., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 47,200, Jun. 11, 1979, abandoned. This application Dec. 10, 1979, Ser. No. 102,094

Int. Cl.[3] C07C *103/52*

U.S. Cl. 260—112.5 R **11 Claims**

1. Analogs of endorphin of the formula

H-Tyr-Gly-Gly-Phe-Met[5]-Thr-Ser-B-Lys-Ser[10]-Gln-Thr-Pro-Leu-Val[15]-Thr-Leu-Phe-Lys-Asn[20]-Ala-Ile-X-Lys-Asn[25]-Ala-Y-Lys-Lys-Gly[30]-Q I

wherein B is Glu or Gln, X is Ile or Val; Y is His or Tyr and

Q is —NH—lower alkyl or $(Gly)_n$—A where n is an integer from 1 to 5 and A is —OH or $—NH_2$

and the pharmaceutically acceptable acid addition salts thereof.

4,250,088

DEMETHYLATED LIGNIN AND PROCESS

Lau S. Yang, Hightstown, N.J., assignor to American Can Company, Greenwich, Conn.

Filed Aug. 20, 1979, Ser. No. 68,180

Int. Cl.[3] **C07G** *39/00*

U.S. Cl. 260—124 R **16 Claims**

1. A method for demethylation of lignin materials to produce a lignin material of improved reactivity and a methyl halide which comprises reacting (1) a lignin material selected from the group consisting of (a) Kraft lignin derived by acid precipitation of black liguor and (b) purified lignosulfonates derived from spent sulfite liquor, said lignosulfonates being substantially free of reducing suguars and having a sulfonic sulfur content of less than about 5 weight percent with an amine hydrochloride or hydrobromide salt at a temperature between about 180° to 250° C.; the amine component of said salt being an aliphatic amine having a boiling point below about 100° C., said amine functioning as a hydrochloride or hydrobromide carrier in the reaction;

(2) continuing said reaction for a period sufficient to permit demethylation;

(3) recovering aliphatic amine and methyl halide as a distillate fraction produced during the reaction; and

(4) recovering demethylated lignin from the reaction mixture.

4,250,089

PROCESS FOR DIAZOTIZING AROMATIC AMINES

Klaus Leverenz, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

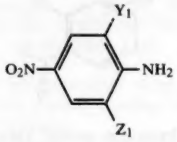
Filed Apr. 8, 1976, Ser. No. 674,930

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1975, 2516032

Int. Cl.[3] **C07C** *113/04;* **C09B** *29/08, 29/26, 29/18*

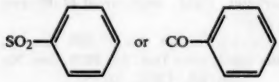
U.S. Cl. 260—141 **5 Claims**

1. In a process for diazotizing an aromatic amine which is not diazotizable or is only incompletely diazotizable in aqueous media containing mineral acid to produce the corresponding diazonium salt of said aromatic amine, the improvement comprising diazotizing an amine of the formula:



wherein

Y_1 represents F, Cl, Br, I, CF_3, CN, SO_2CH_3, $SO_2C_2H_5$, $COCH_3$, CO_2CH_3, $CO_2C_2H_5$, NO_2,



Z_1 represents hydrogen, F, Cl, Br, I, CF_3, CN or NO_2, with the proviso that the sum of the σmeta-values of Y_1 and Z_1 is $>+0.5$,

in a solvent selected from the group consisting of a lower fatty acid nitrile, tetrahydrothiophene-1,1-dioxide, 2-methyltetrahydrothiophene-1,1-dioxide, 3-methyltetrahydrothiophene-1,1-dioxide and 2,5-dimethyl-tetrahydrothiophene-1,1-dioxide by means of a nitrosyl compound selected from the group consisting of nitrosyl chloride, nitrosyl sulfuric acid, and esters of nitrous acid with alcohols in the presence of mineral acid at from −20° C. to 30° C. until the diazotization is completed.

4,250,090

2-AMINO-5-ARYLAZOARYLAZOTHIAZOLE COMPOUNDS

Heinz Eilingsfeld, Frankenthal; Guenter Hansen; Guenther Seybold, both of Ludwigshafen, and Georg Zeidler, Dannstadt-Schauernheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

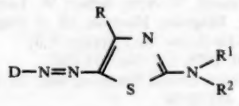
Filed Mar. 27, 1979, Ser. No. 24,248

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1978, 2816507

Int. Cl.[3] **C09B** *31/14;* **D06P** *1/39, 3/06, 3/32*

U.S. Cl. 260—158 **5 Claims**

1. A light fast and wet fast acid azo-dye containing a thiazole coupling component and having the formula:



wherein D is phenyl or naphthyl substituted by arylazo, R is C_1–C_4-alkyl, β-carboxymethyl, or phenyl which is unsubstituted or substituted by chlorine, bromine, methyl, ethyl, C_1–C_4-alkoxy, β-cyanoethyl, β-carboxylethoxy, phenoxy, sulophenoxy, C_1–C_4-alkanoylamino, phenylamino, sulfophenylamino, sulfoethylamino, or hydroxysulfonyl and R^1 and R^2 independently of one another are C_1–C_8-alkyl, C_2–C_8-alkyl which is substituted by hydroxyl, carboxyl, hydroxysulfonyl, cyano, phenyl, C_1–C_8-alkoxy, phenoxy, C_1–C_4-alkanoyloxy, C_1–C_4-alkoxycarbonyl, C_1–C_4-alkanoylamino or C_1–C_4-alkoxycarbonyloxy, allyl, phenyl-C_1–C_5-alkyl or phenyl which is unsubstituted or substituted by chlorine, bromine, C_1–C_4-alkyl, C_1–C_4-alkoxy, cyano, carbamoyl, or hydroxysulfonyl.

4,250,091

WATER-SOLUBLE DISAZO DYESTUFF DERIVED FROM 4,4-DIAMINOBENZANILIDE

Sisto S. Papa, 108, Viale Zara, and Antonino Condo, 16, Via Mercalli, both of Milan, Italy

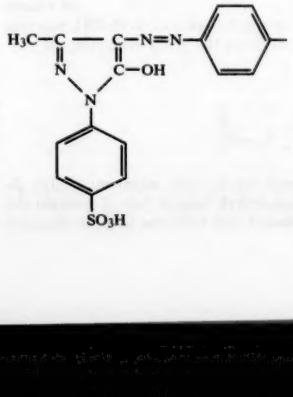
Continuation of Ser. No. 828,310, Aug. 29, 1977, abandoned, which is a continuation of Ser. No. 702,871, Jul. 6, 1976, abandoned, which is a continuation of Ser. No. 542,938, Jan. 22, 1975, abandoned. This application May 7, 1979, Ser. No. 36,569

Claims priority, application Italy, Jan. 30, 1974, 19963 A/74

Int. Cl.[3] **C09B** *31/14, 35/18, 33/12*

U.S. Cl. 260—160 **1 Claim**

1. The sulfonated disazo dyestuff of the formula:



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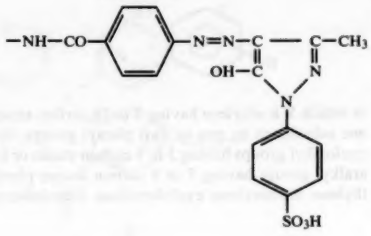


4,250,092

DERIVATIVES OF N-CYANO-AZOMETHINES AND PROCESS FOR THEIR PREPARATION

Franjo Kajfez, Zagreb, Yugoslavia, assignor to CRC Compagnia di Ricerca Chimica S.A., Zurich, Switzerland

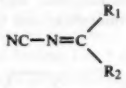
Filed May 14, 1979, Ser. No. 38,838

Claims priority, application Switzerland, May 12, 1978, 5237/78

Int. Cl.³ C07C *125/08*

U.S. Cl. 260—239 E **4 Claims**

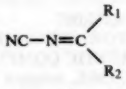
1. N-Cyano-azomethines of formula I



(I)

where R_1 denotes a —SCH_3 group, an alkylamino group, a dialkylamino group, an ω-thiomethylaklylamino group or an ω-hydroxyalkylamino group, and the tosylate, brosylate or mesylate derivatives thereof, all the alkyl groups having at most 4 carbon atoms in the chain, and omega (ω) signifying that the hydroxyl group or thiomethyl moiety of the thiomethylakylamino group is at the end of the alkyl chain, or an N-ethylene-imino group, and where R_2 is as defined for R_1 provided that R_1 and R_2 are not simultaneously a methylthio, alkylamino or an N-ethylene-imino group and R_1 is not alkylamino when R_2 is —SCH_3.

3. An N-cyano-azomethine of formula I



(I)

wherein R_1 denotes a—SCH_3 group, an alkylamino group, a dialkylamino group, an ω-thiomethylalkylamino group or an ω-hydroxyalkylamino group, and the tosylate, brosylate or mesylate derivatives thereof, all the alkyl groups having at most 4 carbon atoms in the chain, and omega (ω) signifying that the hydroxyl group or thiomethyl moiety of the thiomethylalkylamino group is at the end of the alkyl chain, and R_2 an N-ethylene-imino group.

4,250,093

PROCESS FOR THE PREPARATION OF LAOTAMS

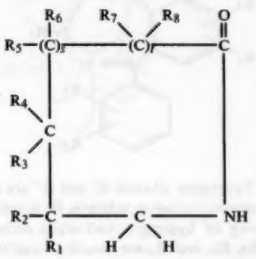
Frederick A. Pesa, Twinsburg, and Anne M. Graham, Northfield, both of Ohio, assignors to The Standard Oil Company (Ohio)

Filed Jun. 29, 1979, Ser. No. 53,606

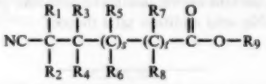
Int. Cl.³ C07D *201/08*

U.S. Cl. 260—239.3 A **26 Claims**

1. A process for producing a five, six or seven-membered saturated nitrogen containing heterocyclic compound comprising contacting a beta, gamma or delta cyano-ester with hydrogen at a temperature in the range of about 50° C. to about 200° C. and a pressure in the range of about 100 psi to about 2000 psi in the presence of a catalyst selected from metallic ruthenium, iron and mixtures thereof; wherein said heterocyclic compound has the following structure:



and wherein said cyanoester has the following structure:



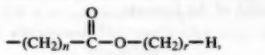
wherein s and t are 0 or 1; and

wherein R_1, R_2, R_3, R_4, R_5, R_6, R_7 and R_8 are each independently selected from:

(1) hydrogen;

(2) C_{1-4} alkyl;

(3) $-(CH_2)_n-O-(CH_2)_r-H$, wherein n and r are each independently 0–4;



(4)

wherein n and r are each independently 0–4; and

wherein R_9 is selected from:

(1) C_{1-30} alkyls; and

(2) carbocyclic radicals containing up to 30 carbon atoms.

25. The process of claim 1 wherein said cyanoester is methyl-3-cyanopropionate and wherein said heterocyclic compound produced is pyrrolidone.

4,250,094

1-(AMINOALKYL) SUBSTITUTED-6-PHENYL-4H-S-TRIAZOLO[4,3-A][1,4]BENZODIAZEPINES

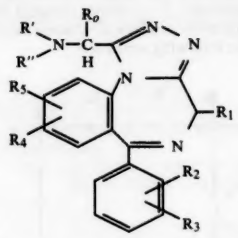
Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 309,213, Nov. 24, 1972, abandoned, which is a continuation-in-part of Ser. No. 138,288, Apr. 28, 1971, Pat. No. 4,141,902, and a continuation-in-part of Ser. No. 201,207, Nov. 12, 1971, abandoned, which is a continuation-in-part of Ser. No. 138,278, Apr. 28, 1971, abandoned. This application Jul. 5, 1979, Ser. No. 55,110

Int. Cl.³ C07D *487/04*; A61K *31/55*

U.S. Cl. 260—245.5 **11 Claims**

1. 1-(Aminoalkyl)subustituted-6-phenyl-4H-s-triazolo[4,3-a][1,4]-benzodiazepines of the Formula II:



II

wherein R_o is hydrogen; wherein R′ and R″ are alkyl of one to three carbon atoms, inclusive; wherein R_1 is selected from the group consisting of hydrogen and alkyl defined as above; wherein R_2, R_3, R_4, and R_5 are selected from the group consisting of hydrogen, alkyl as defined above, halogen, nitro, cyano, trifluoromethyl, and alkoxy, alkylthio, alkylsulfinyl, and alkylsulfonyl, in which the carbon chain moieties are of one to three carbon atoms, inclusive; and the pharmacologically acceptable acid addition salts thereof.

4,250,095

IMIDAZOBENZODIAZEPINES

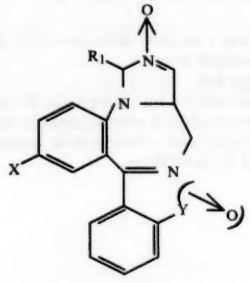
Armin Walser, West Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 60,258, Jul. 25, 1979. This application Apr. 11, 1980, Ser. No. 139,531

Int. Cl.³ C07D *487/04*

U.S. Cl. 260—245.6 **1 Claim**

1. A compound of the formula



wherein X and Y are selected from the group consisting of hydrogen, halogen and trifluoromethyl and R_1 is selected from the group consisting of hydrogen, lower alkyl, phenyl, halophenyl, nitrophenyl and tolyl.

4,250,096

3- AND 4-AZIDOPHTHALIC ACID DERIVATIVES

Vratislav Kvita, Muttenz; Hans Zweifel, Basel, both of Switzerland, and Gerd Greber, Bad Vöslau, Austria, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

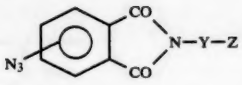
Filed Oct. 5, 1978, Ser. No. 948,857

Claims priority, application Switzerland, Oct. 14, 1977, 12577/77

Int. Cl.³ C07D *209/48*

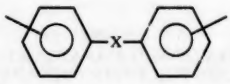
U.S. Cl. 260—326 N **5 Claims**

1. A compound of formula Ib

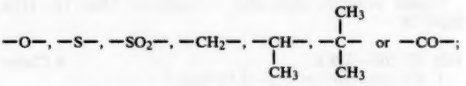


(Ib)

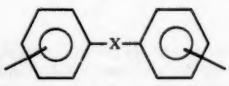
in which Y is alkylene having 2 to 18 carbon atoms; said alkylene substituted by one or two phenyl groups, by one or two cycloalkyl groups having 5 to 8 carbon atoms or by one or two aralkyl groups having 7 or 8 carbon atoms; phenylene, naphthylene, biphenylene, cyclohexylene, dicyclohexylmethane or



where X is



or said phenylene, said naphthylene, said diphenylene, said cyclohexylene, said dicyclohexylmethane or said



substituted, per ring, by one halogen atom, by one alkyl group having 1 to 4 carbon atoms, by one cycloalkyl group having 5 to 7 carbon atoms or by one aralkyl group having 7 or 8 carbon atoms, and Z is —OH.

4,250,097

COMPOSITIONS FOR AND A METHOD OF PREVENTING DIABETIC COMPLICATIONS

Jurg R. Pfister, Los Altos, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Mar. 8, 1978, Ser. No. 884,456

Int. Cl.² C07D *311/86*

U.S. Cl. 260—335 **1 Claim**

1. The compound 7-[methyl(2-hydroxyethyl)amino]sulfonylxanthone-2-carboxylic acid and the pharmaceutically acceptable, non-toxic C_1 to C_6 linear or branched alkyl esters, C_1 to C_6 linear or branched alkyl amides or salts thereof.

4,250,098

CHROMOGENIC COMPOUNDS

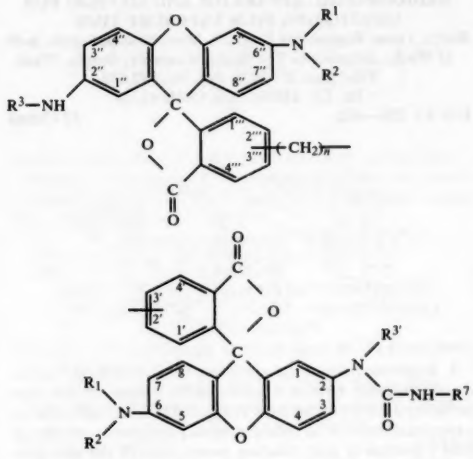
John Chang, Fairfield, Ohio, assignor to Champion International Corporation, Stamford, Conn.

Filed Jul. 27, 1978, Ser. No. 928,470

Int. Cl.³ C07D *493/10*

U.S. Cl. 260—335 **6 Claims**

1. A chromogenic compound represented by the formula



wherein

each of R^1 and R^2 represents alkyl having 1 to 5 carbon atoms, or phenyl,

R^3 and $R^{3'}$ are the same and represent alkyl having 1 to 5 carbon atoms, benzyl or phenyl,

R^7 represents alkyl having 1 to 5 carbon atoms, or phenyl,

the alkylene bridging group $(CH_2)_n$ is attached to either the 2′ or 3′ position and either to the 2‴ or 3‴ position, and

n is an integer from 1 to 6.

4,250,099

MEGASTIGMA-5(11)8-DIEN-4,7-OXIDES AND TETRA-SUBSTITUTED-7-OXA-BICYCLO[3.3.0]-OCTANES

Roman Kaiser, Uster, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.

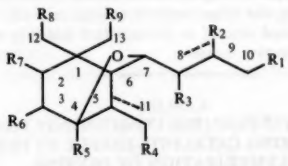
Filed Jan. 29, 1979, Ser. No. 7,273

Claims priority, application Switzerland, Feb. 9, 1978, 1449/78; Dec. 13, 1978, 12677/78

Int. Cl.³ C07D *307/93*

U.S. Cl. 260—346.22 **12 Claims**

1. A compound of the formula:



I

wherein:

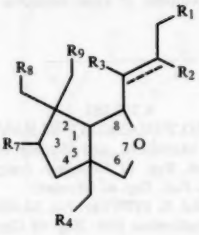
(a) R_1 and R_2 represent a hydrogen atom or a methyl, propyl, vinyl, propenyl or allyl group;

(b) R_3,R_4,R_5,R_6,R_7,R_8 and R_9 each represent a hydrogen atom or a methyl or ethyl group;

(c) the dotted lines represent an optional bond when R_1 and/or R_2 is hydrogen, methyl or propyl and an obligatory bond when R_1 and/or R_2 represents a propenyl, vinyl or allyl group,; and

(d) the 5,11-bond is only saturated when the remainder of the molecule is saturated; excepting those natural mixtures containing megastigma-5(11),8-dien-4,7-oxide.

5. A compound of the formula:



II

wherein:

(a) R_1 and R_2 represent a hydrogen atom or a methyl, propyl, vinyl, propenyl or allyl group;

(b) R_3,R_4,R_7,R_8 and R_9 represent a hydrogen atom or a methyl or ethyl group; and

(c) the dotted lines represent an optional bond when R_1 and/or R_2 is hydrogen, methyl or propyl and an obligatory bond when R_1 and/or R_2 represents a propenyl, vinyl or allyl group,.

4,250,100

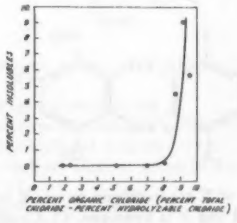
WATER-SOLUBLE EPOXY RESINS AND PROCESS FOR THEIR PREPARATION

James L. Bertram, and Pong Su Sheih, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 895,168, Apr. 11, 1978, abandoned, which is a division of Ser. No. 401,915, Sep. 28, 1973, Pat. No. 4,110,354, which is a continuation-in-part of Ser. No. 67,234, Aug. 26, 1970, abandoned, which is a continuation-in-part of Ser. No. 852,061, Aug. 21, 1969, abandoned, which is a continuation-in-part of Ser. No. 782,611, Dec. 10, 1968, abandoned. This application Aug. 20, 1979, Ser. No. 67,987

Int. Cl.³ C08G *59/04*

U.S. Cl. 260—348.14 **11 Claims**



1. Water-soluble epoxy resins which are the dehydrohalogenated Lewis Acid catalyzed reaction product of glycerine with a mixture containing

(a) from about 0.05 to about 0.65 epoxide equivalents per mole of glycerine of a glycidyl ether of a compound having more than one aliphatic hydroxyl group selected from the group consisting of a glycidyl ether of glycerine epoxyalkyl halide adduct, a diglycidyl ether of a 200–600 molecular weight polyoxyalkylene glycol or mixtures thereof and

(b) from about 1.35 to about 2.95 epoxide equivalents per mole of glycerine of an epoxy alkyl halide having the epoxy group α, β to the halogen wherein the sum of a and b is in the range from about 2.0 to about 2.6 or when the Lewis Acid catalyst is $SnCl_4$ or HF from about 2.0 to about 3 epoxide equivalents per mole of glycerine;

wherein said water soluble epoxy resin contains from about 1.5% to about 8% organic chloride by weight, an epoxide

content of from about 26% to about 33% by weight, and less than about 2% by volume of water-insoluble glycidyl ether constituents.

4,250,101

BIS-EPOXY-DIALKOXY-ALKANES

Manfred Baumann, Mannheim, and Werner Hoffmann, Neuhofen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

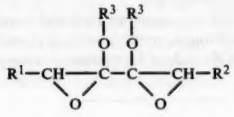
Filed Jul. 5, 1979, Ser. No. 54,863

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1978, 2831676

Int. Cl.³ C07D *303/22*

U.S. Cl. 260—348.57 **3 Claims**

1. A bis-epoxy-dialkoxy-alkane of the general formula I



(I)

where R^1, R^2 and R^3 are alkyl of 1 to 4 carbon atoms.

4,250,102

PROCESS FOR THE MANUFACTURE OF AMINOHYDROXYANTHRAQUINONES

Athanassios Tzikas, Pratteln, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

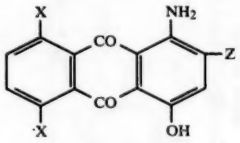
Filed Aug. 21, 1979, Ser. No. 69,106

Claims priority, application Switzerland, Aug. 25, 1978, 9043/78

Int. Cl.³ C07C *103/75, 97/24*

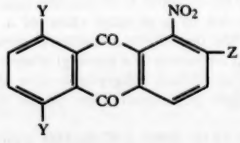
U.S. Cl. 260—377 **3 Claims**

1. A process for the manufacture of an aminohydroxyanthraquinone of the formula



(1)

wherein both of X are hydrogen or one X is $—NH_2$ and the other is —OH and Z is hydrogen, C_1–C_4-alkyl or carboxyl, with the proviso that, if Z is C_1–C_4-alkyl or carboxyl, both of X must hydrogen, which process comprises reacting a nitroanthraquinone of the formula



(2)

wherein both of Y are hydrogen or one Y is $—NO_2$ and the other is hydrogen and Z is as defined for formula (1), with the proviso that, if Z is C_1–C_4-alkyl or carboxyl, both of Y must be hydrogen, in an aprotic dipolar solvent or mixtures thereof, with an alkali metal azide or an alkaline earth metal azide, in the temperature range between 0° and 30° C.

4,250,103

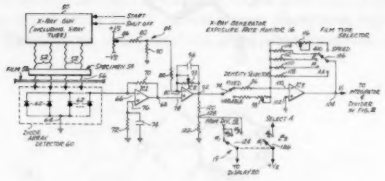
RADIOGRAPHIC APPARATUS AND METHOD FOR MONITORING FILM EXPOSURE TIME

Rolf S. Vatne, Renton, and Wayne E. Woodmansee, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 27, 1978, Ser. No. 973,620

Int. Cl.³ H05B *1/00*; G03B *41/16*

U.S. Cl. 250—402 **22 Claims**



1. Exposure monitoring apparatus for determining the required exposure time in a radiographic system of the type including a source of radiation positioned to direct radiation on a specimen that is to be radiographically examined such that at least a portion of said radiation passes through the specimen and is incident on a photosensitive film for effecting exposure thereof, and further including a variable control means associated with said source that when set establishes the spectral content of said radiation, said exposure monitoring apparatus comprising:

radiation detection means positioned for receiving that radiation which passes through a specimen and which would be incident on a photosensitive film, said radiation detection means producing a radiation-intensity signal representing the intensity of the radiation received by said radiation detection means;

function generator means for storing a plurality of exposure values, one value for each of a corresponding plurality of correlative settings of the variable control means, each of said exposure values being predetermined as the product of that intensity of radiation received by said radiation detection means for a predetermined time which causes a photosensitive film to reach a predetermined density when said variable control means is at said correlative setting, said function generator means responsive to the setting of the variable control means for producing an exposure signal representative of a particular exposure value; and,

divider means responsive to said radiation-intensity signal and said exposure signal for producing an output signal representing the time required to expose a film to said predetermined density at the radiation intensity received by said detection means.

4,250,104

CATALYST-FORMING COMPONENTS FOR PREPARING CATALYSTS USEFUL IN THE POLYMERIZATION OF OLEFINS

Umberto Giannini, Milan; Enrico Albizzati, Arona, and Sandro Parodi, Oleggio, all of Italy, assignors to Montedison S.p.A., Milan, Italy

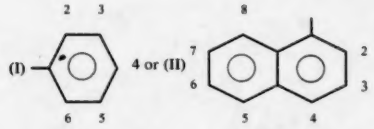
Division of Ser. No. 703,546, Jul. 8, 1976, Pat. No. 4,107,416. This application Jun. 19, 1978, Ser. No. 916,723

Claims priority, application Italy, Jul. 9, 1975, 25217 A/75

Int. Cl.³ C07F *5/06*

U.S. Cl. 260—448 AD **9 Claims**

1. As catalyst-forming components for preparing catalysts for the polymerization of olefins, compounds having a structure defined by one of the following formulas: R_2AlOR'' and $RAl(OR'')_2$ in which R represents alkyl radicals containing from 1 to 12 carbon atoms inclusive, and R'' corresponds to one of the following structures (I) or (II):



wherein in positions 2 and 6 in structure (I) and position 2, optionally also position 8, in structure (II) there are present radicals at least one of which exerts a steric hindrance higher than that of the group $—C_2H_5$.

4,250,105

PRODUCTION OF ALIPHATIC COMPOUNDS CONTAINING ISOCYANATO AND HYDROXYL FUNCTIONALITY

Edward E. Flagg, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 10,299, Feb. 8, 1979, abandoned. This application Sep. 21, 1979, Ser. No. 77,871

Int. Cl.[3] **C07C** *118/00, 119/042*

U.S. Cl. 260—453 P **4 Claims**

1. A process for the production of aliphatic compounds containing both isocyanato and hydroxyl functionality of the formula OCN—R—OH comprising reacting an alkali metal salt of a hydroxy-substituted aliphatic compound of the formula HO—R—OH by contacting the cyanogen halide in an organic solvent at a temperature from about −40° C. to about +80° C. wherein R is an aliphatic straight or branched chain divalent radical containing from three to twenty carbon atoms selected from the group consisting of alkylene, hydroxyalkylene, and $—CH_2(CH_2)_n—X]_n—CH_2(CH_2)_p—$ wherein X is oxygen or sulfur and m, n and p are integers from 1 to 4, respectively.

4,250,106

PROCESS FOR THE PREPARATION OF SUBSTANTIALLY PURE CYCLO ALIPHATIC DIISOCYANATE STEREOISOMERS

Herbert L. Heiss, New Martinsville, W. Va., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Division of Ser. No. 8,450, Feb. 1, 1979. This application Oct. 15, 1979, Ser. No. 84,484

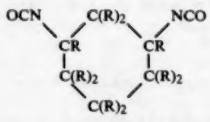
Int. Cl.[3] **C07C** *119/045*

U.S. Cl. 260—453 SP **2 Claims**

1. A process for the separation of substantially pure cycloaliphatic diisocyanate reactive (cis-form) stereoisomers from cycloaliphatic diisocyanate non-reactive (transform) stereoisomers comprising the steps of:

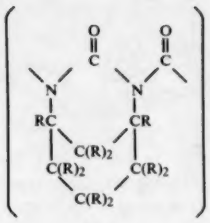
(a) reacting:

(1) cycloaliphatic diisocyanates of the formula



where R is hydrogen or an aliphatic hydrocarbon group having from 1 to 4 carbon atoms, at least one of said R's being an aliphatic hydrocarbon having from 1 to 4 carbon atoms and wherein the isocyanato groups are both positioned axially or equatorially in the presence of

(2) catalysts selected from the group consisting of lead catalysts, tertiary amines, alkali metal hydroxides, and sodium methoxide thereby producing a cyclic nylon-1 type linear polymer having regularly reoccuring bicyclic structural units of the formula



(b) precipitating said cyclic nylon-1 type linear polymers;

(c) filtering and washing said precipitated cyclic nylon-1 type linear polymers;

(d) decomposing said precipitated polymer using distillation thereby producing a distillate;

(e) collecting said distillate containing a substantially pure monomer consisting of reactive (cis-form) stereoisomers.

4,250,107

N-(SULFOALKANE) AMINO ALKANE PHOSPHONIC ACIDS AND THEIR WATER-SOLUBLE SALTS

Klaus Sommer, Heidelberg, and Gottfried Schoebel, Ludwigshafen, both of Fed. Rep. of Germany, assignors to Benckiser-Knapsack GmbH, Ladenburg, Fed. Rep. of Germany

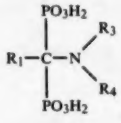
Filed Nov. 6, 1978, Ser. No. 958,188

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1977, 2758306

Int. Cl.[3] **C07F** *9/38;* **C02B** *5/06;* **D06M** *9/08*

U.S. Cl. 260—502.5 **9 Claims**

1. A compound of the formula



R_1 being hydrogen, methyl or a carboxy lower alkylene group;

R_3 being hydrogen or methyl; and

R_4 being an alkylene sulfonic acid group of the Formula $C_nH_{2n}SO_3H$ and n equals 1–14 or 17

wherein R_1 is a carboxy alkylene group or R_3 is methyl or n equals 12–14 or 17;

and the water-soluble salts thereof.

4,250,108

PROCESS FOR PREPARING (2-OXO-3-BORNYLIDENE/METHYL)-BENZENE SULFONIC ACIDS

Claude Bouillon, Eaubonne; Charles Vayssie, Aulnay-sous-Bois, and Francoise Richard, Montreuil-sous-Bois, all of France, assignors to L'Oreal, Paris, France

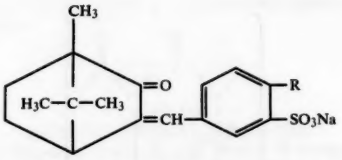
Division of Ser. No. 497,469, Aug. 14, 1974, Pat. No. 4,165,336, which is a continuation-in-part of Ser. No. 440,570, Feb. 7, 1974, abandoned. This application Sep. 29, 1978, Ser. No. 947,152

Claims priority, application Luxembourg, Feb. 19, 1973, 67061

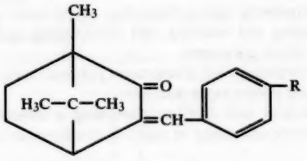
Int. Cl.[3] **C07C** *143/26, 143/28*

U.S. Cl. 260—511 **8 Claims**

6. A process for the preparation of a compound of the formula



wherein R is alkyl having 1–4 carbon atoms or halogen comprising reacting a compound of the formula



wherein R has the meaning given above with oleum, maintaining the reaction temperature at about 35° C.–50° C. and precipitating the sodium salt of the resulting sulfonic acid by the addition of a saturated sodium chloride solution at a temperature below 25° C.

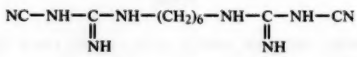
4,250,109

PROCESS FOR PREPARING HEXAMETHYLENE BIS-DICYANDIAMIDE

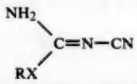
Saburo Uchikuga, Yokohama; Michiro Itoh, Hachioji, and Katsuyasu Nagahama, Sagamihara, all of Japan, assignors to Sogo Pharmaceutical Company Limited, Kanagawa, Japan

Filed Aug. 7, 1979, Ser. No. 65,144
Claims priority, application Japan, Aug. 31, 1978, 53-105490
Int. Cl.[3] C07C *145/04*
U.S. Cl. 564—104 **2 Claims**

1. A process for preparing hexamethylene.bis-dicyandiamide of the following formula:



characterized in that the process comprises reacting a compound of the following formula:



wherein R is an alkyl group of one to ten carbon atoms and X is an oxygen or sulfur atom,
with hexamethylenediamine.

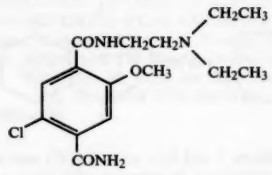
4,250,110

METHOD OF PREPARING METOCLOPRAMIDE

Joji Nishikido, Fuji; Nobuhiro Tamura, Chigasaki; Yohei Fukuoka, Kurashiki, and Hiroyuki Yamane, Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 19, 1979, Ser. No. 58,809
Claims priority, application Japan, Jul. 31, 1978, 53-92564
Int. Cl.[3] C07C *103/82, 101/42*
U.S. Cl. 564—156 **1 Claim**

1. 2-Chloro-4-N-(β-diethylaminoethyl)aminocarbonyl-5-methoxybenzamide of the formula (I),



(I)

4,250,111

MIXED CATALYST FOR THE HYDROLYSIS OF NITRILES TO AMIDES

Virgil L. Seale, Houston, Tex., and Louis A. Goretta, Naperville, Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 676,541, Apr. 12, 1976, abandoned, which is a continuation-in-part of Ser. No. 490,920, Jul. 22, 1974, abandoned, which is a continuation-in-part of Ser. No. 260,263, Jun. 6, 1972, abandoned. This application Jul. 12, 1976, Ser. No. 704,170
Int. Cl.[3] C07C *102/08*
U.S. Cl. 564—129 **12 Claims**

1. In a process of the type wherein olefinic nitrile having from 3 through 6 carbon atoms per molecule is hydrolyzed with water in the presence of a copper catalyst under aqueous liquid phase conditions to produce the corresponding olefinic amides, the improvement which comprises using as said catalyst a particulate copper catalyst which has been prepared by the steps of:

(a) first mixing with a first aqueous solution containing a dissolved water soluble cupric salt and a dissolved water soluble metal salt wherein the metal is selected from the group consisting of scandium, titanium, vanadium chromium, manganese, iron, cobalt, nickel, zinc, rare earths and aluminum, said aqueous solution containing a total of from about 25 to 50 weight percent on a total solution basis of said salts and having a weight ratio of said metal to said copper ranging from about 1:250 to 10:100, a second aqueous solution containing on a total second solution basis from about 3 to 28 weight percent ammonia, the total quantity of said second solution so first mixed being sufficient to achieve in the resulting mixture a mole ratio of ammonia to copper ranging from about 0.25 to 0.5 based on total copper present, the quantity of ammonia so mixed being sufficient to effect only a partial precipitation of said salts,

(b) secondly mixing with said resulting mixture a third aqueous solution containing on a total third solution basis from about 5 to 40 weight percent dissolved alkali metal hydroxide, the total quantity of said second solution so secondly mixed being sufficient to achieve in the resulting mixture a mole ratio of alkali metal hydroxide to copper ranging from about 2 to 2.5 based on total copper present, the amount of alkali metal hydroxide so mixed being sufficient to effect a substantially complete precipitation of all metal cations present initially in such first aqueous solution,

(c) heating the resulting so-formed precipitate to temperature in the range from about 55° to 105° C. for a time which is sufficient to substantially convert said precipitate to metal oxides,

(d) separating the resulting precipitate,

(e) washing the so-separated precipitate to a pH in the range from about 7.5 to 10,

(f) reducing the so-recovered precipitate under aqueous liquid phase conditions in the weight ratio 1:10 to 1:20 of such precipitate (dry weight basis) to water in the presence initially of at least about 10 psig hydrogen and a noble metal of rhenium catalytic agent using a catalyst metal loading of at least about 0.02 weight percent based upon total weight of such precipitate (dry weight basis) at

a temperature ranging from about 0° to 150° C. for a time which is substantially completely sufficient to reduce said so-washed precipitate and at a pH of from about 9 to 10.

4,250,112

POLYALKYLENEPOLYAMINES CONTAINING QUATERNARY DIALKYLAMMONIUM GROUPS

Wilfried Löbach, Bonn; Wolfgang Lehmann, Leverkusen, and Friedhelm Müller, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

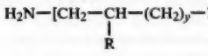
Filed May 8, 1979, Ser. No. 37,007

Claims priority, application Fed. Rep. of Germany, May 10, 1978, 2820488

Int. Cl.³ C07C *91/12*

U.S. Cl. 564—291 **5 Claims**

1. Water-soluble polyalkylenepolyamines which are not self-crosslinking and contain quaternary dialkylammonium groups, and are obtained by reaction in an aqueous medium at temperatures of 0° to 100° C., at a total concentration of 10 to 60%, and at pH values above 6 of polyalkylenepolyamines of the general formula



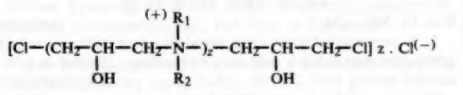
in which

R denotes hydrogen or methyl,

y denotes the number 0 or 1 and the y's may be identical or different and

x denotes a number from 2 to 15,

with bifunctional compounds of the general formula



in which

z denotes an integer from 1 to 6 and

R_1 and R_2 denote lower alkyl or lower hydroxylalkyl, 0.1 to 0.5 mol of the bifunctional compound being employed per mol of basic nitrogen of the polyalkylenepolyamine.

4,250,113

CHEMICAL COMPOUNDS

Vegard Nordal, and Hugo Holtermann, both of Oslo, Norway, assignors to Nyegaard & Co. A/S, Oslo, Norway

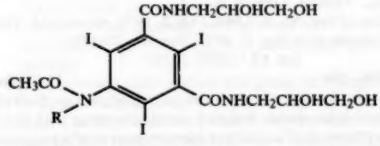
Continuation of Ser. No. 805,351, Jun. 10, 1977, abandoned. This application Aug. 24, 1979, Ser. No. 69,589

Claims priority, application United Kingdom, Jun. 11, 1976, 24338/76

Int. Cl.³ C07C *103/26*

U.S. Cl. 564—153 **4 Claims**

1. Compounds of the general formula:



(wherein R represents the group —CH_2CH_2OH or —CH_2.$CHOHCH_2OH$).

4,250,114

PROCESS FOR THE RECOVERY OF POLYARYLPOLYAMINES

Efim Biller, Dufourstrasse 42, Zürich, Switzerland

Continuation of Ser. No. 792,951, May 2, 1977, abandoned, which is a continuation-in-part of Ser. No. 690,341, May 26, 1976, abandoned, which is a continuation of Ser. No. 474,302, May 30, 1974, abandoned. This application Jun. 12, 1978, Ser. No. 914,814

Claims priority, application Austria, Sep. 17, 1973, 7991/73; Apr. 24, 1974, 3508/74; Switzerland, Nov. 11, 1975, 14618/75; May 5, 1976, 5854/76; Aug. 4, 1976, 10049/76; Nov. 6, 1976, 14011/76

Int. Cl.³ C07C *85/26*

U.S. Cl. 564—315 **17 Claims**

1. In the process wherein an arylamine and formaldehyde are condensed in the presence of aqueous acid to form polyarylpolyamine salts, and polyarylpolyamine and catalyst are recovered, the improvement which comprises effecting the recovery of polyarylpolyamine by contacting the polyarylpolyamine salt-containing reaction solution at about 18° to 35° C. with sufficient arylamine to form an aqueous phase and an organic phase, the organic phase comprising polyarylpolyamine and arylamine and the aqueous phase comprising the acid salt of the arylamine, the mixture of reaction solution and arylamine containing no more than 50% of a hydrophobic solvent based on the weight of arylamine.

4,250,115

PREPARATION OF TERTIARY AMINES

Tamotsu Imai, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 20, 1978, Ser. No. 971,282

Int. Cl.³ C07C *85/18*

U.S. Cl. 564—436 **10 Claims**

1. A process for the preparation of tertiary amines which comprises reacting an olefinic compound, carbon monoxide, hydrogen and a nitrogen-containing compound having the formula:

in which the R's are independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, aralykyl and alkaryl radicals in the presence of a rhodium catalyst selected from the group consisting of rhodium metal, nitrate, halides, chlorodicarbonylrhodium dimer and chlorobis(ethylene)rhodium dimer, and recovering the resultant tertiary amine.

4,250,116

PRODUCTION OF METHYL AND ETHYLAMINES WITH RHODIUM-IRON CATALYSTS

William J. Bartley, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 19, 1979, Ser. No. 105,406

Int. Cl.³ C07C *85/00*

U.S. Cl. 564—467 **5 Claims**

1. A heterogeneous process for producing monoamines in which the nitrogen is bonded only to methyl, ethyl, hydrogen or combinations thereof which comprises contacting a mixture of carbon monoxide, hydrogen and a nitrogen-containing compound selected from the group consisting of ammonia, nitric oxide and mixtures thereof with a heterogeneous solid catalyst comprising rhodium and iron at reaction conditions which comprise a temperature of from about 200° to about 450° C. a pressure of from about 15 to about 10,000 psig and a mole ratio of hydrogen to carbon monoxide of from about 20:1 to about 1:20 such that the said monoamines are formed in a collective amount of at least 50 weight percent of the total amine products of the reaction.

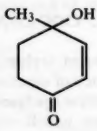
4,250,117

4-HYDROXY-4-METHYL-CYCLOHEXEN-2-ONE-1

Katsuhiro Takahashi, Yokohama; Shigeru Muraki, Ryugasaki, and Toshio Yoshida, Yokohama, all of Japan, assignors to Takasago Perfumery Co., Ltd., Tokyo, Japan

Filed Aug. 8, 1978, Ser. No. 932,076
Claims priority, application Japan, Aug. 8, 1977, 52-94162
Int. Cl.[3] C07C *49/713*
U.S. Cl. 568—377 1 Claim

1. 4-Hydroxy-4-methyl-cyclohexen-2-one-1 having the formula (I):



(I)

4,250,118

PROCESS FOR THE PREPARATION OF CYCLOHEXANONE

Theodorus J. van de Mond, and Hubertus J. A. Delahaye, both of Geleen, Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed Apr. 20, 1979, Ser. No. 31,871
Claims priority, application Netherlands, Apr. 29, 1978, 7804667
Int. Cl.[3] C07C *45/65*
U.S. Cl. 568—338 5 Claims

1. In a process for the preparation of cyclohexanone from benzene including:

a hydrogenation zone wherein benzene is hydrogenated in a gaseous phase to form cyclohexane;

an oxidation zone wherein cyclohexane is oxidized in a liquid phase to form a first mixture containing cyclohexanol and cyclohexanone;

a cyclohexanone distillation zone wherein cyclohexanone is separated from a mixture containing cyclohexanone and cyclohexanol, leaving a cyclohexanol containing effluent; and

a dehydrogenation zone wherein cyclohexanol is catalytically dehydrogenated to cyclohexanone and a hydrogen containing gas, resulting in a second mixture containing cyclohexanol and cyclohexanone;

the improvement comprising introducing said hydrogen containing gas from said dehydrogenation zone into a washing zone wherein said gas is washed with a washing liquid selected from the group consisting of cyclohexane and benzene, and the washed hydrogen containing gas thus obtained is fed into said hydrogenation zone.

4,250,119

PROCESS FOR THE PRODUCTION OF ACETONE FROM ISOBUTYRALDEHYDE

Helmut Scharf, Schermbeck; Gerhard Franz, and Günther Hökele, both of Marl, all of Fed. Rep. of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Aug. 7, 1978, Ser. No. 931,665
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1977, 2739269
Int. Cl.[3] C07C *45/32*
U.S. Cl. 568—389 13 Claims

1. In a process for the production of acetone by the catalytic, oxidative decarbonylation of isobutyraldehyde in the gaseous phase wherein a gaseous mixture of 1 to 8% by volume of isobutyraldehyde and at least a stoichiometric amount of oxygen, is contacted with a zinc oxide supported copper oxide catalyst, the improvement consisting essentially of said zinc oxide supported copper oxide catalyst having about 2.5 to 25 percent by weight graphite, based on the finished catalyst.

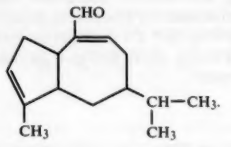
4,250,120

NOVEL BICYCLODECADIENE COMPOUNDS AND PROCESS FOR PRODUCING THEM

Shingo Marumo, Owariasahi, and Masato Katayama, Nagoya, both of Japan, assignors to Noda Institute for Scientific Research, Noda, Japan

Division of Ser. No. 945,831, Sep. 26, 1978, Pat. No. 4,178,462. This application Jun. 20, 1979, Ser. No. 50,226
Claims priority, application Japan, Sep. 29, 1977, 52-116139
Int. Cl.[3] C07C *47/445*
U.S. Cl. 568—445 1 Claim

1. 5-Isopropyl-8-methyl bicyclo[5.3.0]deca-2,8-diene-2-carboaldehyde having a chemical structure represented by the formula



4,250,121

CATALYTIC OXIDATION OF ALCOHOLS WITH MOLECULAR OXYGEN TO FORM CARBONYL COMPOUNDS

Hubert Mimoun, Rueil-Malmaison, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Filed May 24, 1979, Ser. No. 41,855
Claims priority, application France, May 24, 1978, 78 15671
Int. Cl.[3] C07C *45/38, 45/39*
U.S. Cl. 568—431 16 Claims

1. A process for producing an aldehyde or ketone, which comprises contacting a primary or secondary alcohol or polyalcohol having from 2 to 30 carbon atoms per molecule with a sufficient partial pressure of molecular oxygen at a sufficient temperature in the presence of a catalyst system comprising:

(A) a ruthenium salt or complex having the formula RuX_nL_m; wherein X is halogen, sulfate, nitrate, carboxylate, perchlorate, tetrafluoborate or acetylacetonate; n is the integer 2 or 3; L is a water, a phosphine, an arsine or a diolefin ligand; and m is the integer 0, 1, 2, 3 or 6; and

(B) a copper or iron salt or complex having the formula $MZ_pL'_q$; wherein M is copper or iron; Z is halogen, sulfate, nitrate, carboxylate, perchlorate or tetrafluoborate; p is the integer 1, 2 or 3; L is a water, dimethylformamide, hexamethylphosphorotriamide or dimethylsulfoxide ligand; and q is an integer from 0 to 6.

4,250,122

PROCESS AND CATALYST MIXTURE FOR THE PARA-DIRECTED CHLORINATION OF ALKYLBENZENES

Henry C. Lin, Grand Island, and Stephen Robota, North Tonawanda, both of N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Continuation of Ser. No. 874,968, Feb. 3, 1978, abandoned. This application Sep. 7, 1979, Ser. No. 73,472
Int. Cl.[3] C07C *25/06*
U.S. Cl. 570—209 11 Claims

1. A process for the directed nuclear chlorination of alkylbenzenes which comprises reacting an alkylbenzene with chlorine in the presence of a catalyst mixture previously prepared by the steps of (a) reacting sulfur monochloride with toluene or chlorotoluene in the presence of a ferric chloride catalyst; and (b) reacting the reaction product of step (a) with chlorine.

4,250,123
SUBSTITUTED PHENYLPROPYL HALIDES

Ernst Buschmann, Ludwigshafen; Norbert Goetz, Worms; Bernd Zeeh, Ludwigshafen, and Jüergen Varwig, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

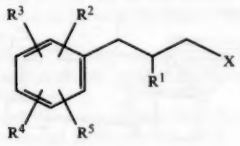
Filed May 11, 1979, Ser. No. 38,274

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1978, 2830120

Int. Cl.³ C07C *21/24*

U.S. Cl. 260—185 **4 Claims**

1. A phenylpropyl halide of the general formula



III

where R^1 is hydrogen or an aliphatic radical of 1 to 10 carbon atoms, R^2 is hydrogen, alkyl of 1 to 3 carbon atoms, fluorine or methoxy, R^3 is an aliphatic radical of 2 to 20 carbon atoms, a cycloaliphatic or bicycloaliphatic radical of 5 to 7 carbon atoms or haloalkyl of 3 to 10 carbon atoms, R^4 and R^5 are each independently of one another hydrogen, chlorine, bromine, nitro or acetyl, and X is chlorine or bromine, with the proviso that R^3 is haloalkyl of 3 to 10 carbon atoms if R^2, R^4 and R^5 are simultaneously hydrogen.

4,250,124
ORGANIC PHOSPHORUS COMPOUNDS POSSESSING 3-HYDROXYALKYLPHOSPHINIC ACID ESTER GROUPS

Walter Dürsch; Fritz Linke, both of Königstein, and Hans-Jerg Kleiner, Kronberg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

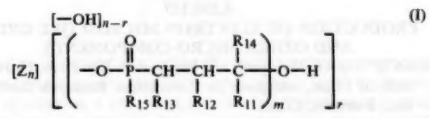
Filed Sep. 24, 1979, Ser. No. 78,135

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1978, 2841941

Int. Cl.³ C07F *9/29*

U.S. Cl. 260—928 **2 Claims**

1. Organic phosphorus compounds possessing 3-hydroxyalkylphosphinic acid ester groups, of the general formula I



(I)

wherein the individual symbols of the above formula I have the following meaning:

n is an integer from 1 to 6, preferably 1 to 4;

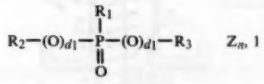
r is an integer from 1 to n, that is to say from 1 to 6, and is preferably the same number as n;

m is 1 if r<n, or is a number from 1 to 150, preferably 2 to 10, if r is equal to n;

R_{11}, R_{12}, R_{13} and R_{14} are identical or different, optionally unsaturated and/or branched, alkyl radicals with 1 to 4 carbon atoms or, preferably, are hydrogen;

R_{15} has the same meaning as R_{11}, other than hydrogen, and is preferably (C_1–C_3)-alkyl, and particularly preferentially methyl;

Z_n is a n-valent radical from the group of straight-chain or branched aliphatic or araliphatic hydrocarbon radicals with 1 to 22, preferably 1 to 8, C atoms, which can optionally be interrupted by up to 2 —S— and/or NR_2- radicals, where R_2 is (C_1–C_4)-alkyl, especially methyl, and/or be substituted by fluorine, chlorine or bromine atoms or by optionally unsaturated carboxylic acid ester groups or carboxamide, carbamate or urea groups or by primary, secondary or tertiary amino groups; or is a hydrocarbon radical, containing ether groups, with equivalent weights of up to 8,000, preferably up to 4,000, resulting from oxyethylation and/or oxypropylation of n-valent aliphatic, araliphatic or aromatic hydroxyl compounds, amines and/or monocarboxylic or dicarboxylic acids with 1 to 22, preferably 1 to 10, C atoms, the araliphatic or aromatic radicals being derived from benzene, alkylbenzenes or alkylenebenzenes with up to 18 C atoms, naphthalene, diphenyl, diphenylmethane, diphenylethane or 2,2-diphenylpropane, and being optionally substituted in the nucleus by 1 or 2 methoxy or ethoxy groups, or optionally substituted, preferably up to five times, in the nucleus and/or in the side chains by F, Cl or Br atoms; or is a phosphorus-containing radical of the general formula



Z_n, 1

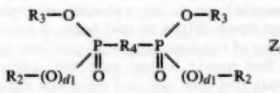
in which

the indices d_1, independently of one another are 0 and 1 and

R_1 is alkyl, hydroxyalkyl, optionally (C_1–C_2)-alkylated or -dialkylated aminoalkyl, halogenoalkyl (preferably Cl-alkyl) with 1 to 3 C atoms, alkenyl with 2 or 3 C atoms or phenyl, which can optionally be substituted by 1 or 2 halogen atoms, preferably Cl or Br, and

R_2 and R_3 have the same meaning as R_1, with the restriction that at least one of the radicals R_2 or R_3 is an alkyl radical with 2–5 C atoms;

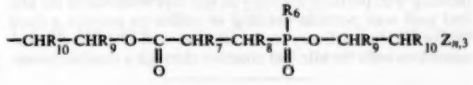
or is a phosphorus-containing radical of the formula



$Z_{n,2}$

in which d_1, R_2 and R_3 have the same meanings as $Z_{n,1}$ and R_4 denotes a straight-chain or branched (C_1-C_{10})-alkylene, phenylene or xylylene radical or a radical

where Y is OH or NH_2 and R_5 is (C_1-C_3)-alkyl; or is a phosphorus-containing radical of the general formula



$Z_{n,3}$

in which

R_6 denotes a (C_1–C_4)-alkyl group which can optionally be substituted, preferably monosubstituted, by halogen, especially chlorine, a cycloalkyl group with up to 8 C atoms, especially cyclopentyl or cyclohexyl, an alkylene group with up to 4 C atoms, especially vinyl and allyl, or a phenyl or benzyl group which is optionally substituted, preferably monosubstituted, disubstituted or trisubstituted, by halogen, preferably chlorine and/or bromine,

R_7 denotes hydrogen or a (C_1–C_4)-alkyl group, preferably methyl,

R_8 denotes hydrogen or a (C_1–C_2)-alkyl group, preferably

methyl, but at least one of the radicals R_7 and R_8 is hydrogen,

R_9 denotes hydrogen, methyl or chloromethyl and

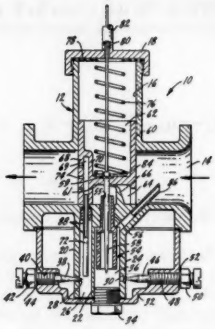
R_{10} denotes hydrogen, methyl or ethyl, preferably hydrogen.

4,250,125

SLIDE VALVE CARBURETOR IDLE FUEL DELIVERY SYSTEM

Daniel L. Donovan, Decatur, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jul. 16, 1979, Ser. No. 58,036
Int. Cl.³ F02M 9/06
U.S. Cl. 261—41 B **8 Claims**



1. A carburetor having a body defining both an air induction passage extending therethrough and a guide passage substantially perpendicular to the air induction passage, a slide valve mounted in said guide passage for axial movement in said guide passage in a direction perpendicular to said air induction passage, said carburetor body having a plurality of depending wall portions, a float bowl affixed to said body, a main fuel well defined by certain of the depending wall portions and the float bowl, a main fuel nozzle having an orifice communicating between the main fuel well and said induction passage, and a main fuel metering pin received within said main fuel nozzle and movable with said slide valve for varying the effective cross-sectional area of the main fuel nozzle orifice, wherein the improvement comprises an idle fuel system in which the slide valve has wall portions defining an idle fuel chamber, one of said slide valve wall portions defining at least one idle fuel aperture opening into said induction passage downstream from said main fuel nozzle, means including the carburetor body for occluding the idle fuel aperture as said slide valve is retracted within said guide passage to withdraw the main fuel metering pin, one of said certain depending wall portions defining the main fuel well also defines an orifice in the wall, thus providing a fixed rate of main fuel delivery, and the other of said certain depending wall portions cooperates with another of the depending wall portions to define an idle fuel well, one of the idle fuel well wall portions defining an orifice to provide a fixed rate of idle fuel delivery to the idle fuel well which well communicates with the idle fuel chamber through a conduit means.

4,250,126

CHLORINE GENERATOR AND METHOD

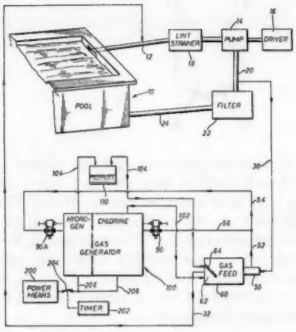
Dow Yates, Loop 336, Villa Torres, Apt. #75D, Conroe, Tex. 77301

Division of Ser. No. 25,291, Mar. 30, 1979. This application Jun. 18, 1979, Ser. No. 49,085
Int. Cl.³ B01F 3/04
U.S. Cl. 261—70 **7 Claims**

1. A feed system for intermixing gaseous chlorine with a supply of water for use in chlorinating a desired body of water, comprising:

(a) a housing defining an enclosed major chamber for receiving the flow of water and an enclosed minor chamber formed as a part of the major chamber to receive both the gaseous chlorine and the flow of water, the major and minor chambers being in fluid communication by an unrestricted flow path free of any flow regulation means such that the water supplied to the main chamber may freely flow into the minor chamber;

(b) a first conduit in fluid communication with the minor chamber for supplying the gaseous chlorine thereto from a source, said first conduit being free of any flow regulation means such that gaseous chlorine may freely flow into the minor chamber for mixing with water;



(c) a second conduit in fluid communication with the minor chamber for conveying water and intermixed chlorine from the housing to the desired body of water, said second conduit being free of any flow regulation means such that the water and intermixed chlorine may flow unrestricted into said second conduit;

(d) means for supplying a stream of water to the major chamber; and

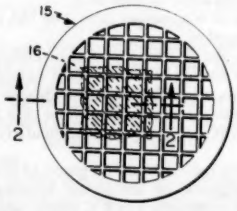
(e) a control valve for regulating the flow of water from the supply means to the major chamber in order to maintain an essentially constant volume of water within both said major and minor chambers.

4,250,127

PRODUCTION OF ELECTRON MICROSCOPE GRIDS AND OTHER MICRO-COMPONENTS

John B. Warren, Westport, and Michael R. Kundrath, Fairfield, both of Conn., assignors to Connecticut Research Institute, Inc., Fairfield, Conn.

Division of Ser. No. 825,243, Aug. 17, 1977, Pat. No. 4,163,900. This application Apr. 23, 1979, Ser. No. 32,569
Int. Cl.³ B29C 1/02
U.S. Cl. 264—22 **15 Claims**



2. A process for simultaneously fabricating a plurality of electron microscopy specimen supports by molding the plurality of specimen supports, with each of said supports having a

diameter of about 3.0 millimeters and a thickness of about 1.5 millimeters, comprising the following steps:

(A) applying a layer of photo-resist material to the surface of a mold fabricated from a material having a different solubility than the composition forming the specimen support;

(B) masking the top surface of the photo-resist with the shape of a plurality of independent, separate, discrete, specimen supports;

(C) exposing the photo-resist to a source of electro-magnetic energy;

(D) developing the photo-resist so as to dissolve the masked, unexposed portions of the photo-resist, thereby obtaining a plurality of outlines on the surface of the mold, with each outline comprising the shape of the desired specimen support;

(E) etching the exposed surface of the mold material to a depth approximately equal to the thickness of the desired specimen supports;

(F) inserting the composition to form the specimen supports into the etched portions of the mold;

(G) removing any excess material of the composition for forming the specimen supports from the surface of the mold; and

(H) chemically removing the mold in a solution to which the specimen support composition is chemically inert.

4,250,128

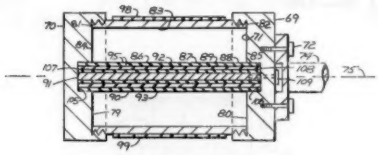
PROCESSES AND APPARATUSES FOR PREPARING PERMANENT MAGNET STATORS

John H. Meckling, Altamonte Springs, Fla., assignor to Magna Motors Corporation, Altamonte Springs, Fla.

Division of Ser. No. 545,173, Jan. 29, 1975, Pat. No. 4,004,167. This application Aug. 16, 1976, Ser. No. 714,937

Int. Cl.³ H02K *15/02*; B29C *5/04*

U.S. Cl. 264—24 **24 Claims**



1. An apparatus for centrifugally casting a stator component for a dynamoelectric machine comprising a mold having an axis of rotation, a core component extending along said axis, and an annular cavity surrounding said core for receiving material to be cast therein, and means connected to the mold for rotating said mold about said axis, and core component comprising magnetic means having circumferentially spaced apart arcuate pole faces which are radially offset from said axis and face said cavity.

10. A process for making a permanently magnetized annular structure comprising confining a deformable mass of hardenable synthetic plastic material that contains dispersed particles of a magnetically attractable and anisotropic ferrite material in an annular cavity of a mold, rotating the mold about the axis of the cavity while subjecting the particles to a magnetic field which rotates with the mold about said axis and traverses a path through the cavity between circumferentially spaced and outwardly facing pole faces that are of opposite polarity and confront the cavity radially outwardly of said axis, thereby to magnetically orient and compact said particles in a region extending through the cavity between said pole holes, and thereafter hardening said plastic material to maintain the magnetic orientation and particle compactness in said region.

4,250,129

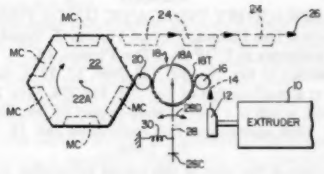
METHOD FOR THE CONTINUOUS FORMATION OF BIAXIALLY ORIENTED THERMOPLASTIC MATERIALS AND FORMING ARTICLES THEREFROM IN A CONTINUOUS PROCESS

Thomas W. Winstead, Baltimore, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

Filed Mar. 13, 1978, Ser. No. 886,160

Int. Cl.³ B29H *19/00*; B29D *7/04*

U.S. Cl. 264—37 **12 Claims**



1. The method of forming products of biaxially oriented thermoplastic material comprising:

continuously extruding a relatively narrow web of thermoplastic material and continuously transporting the extruded web at a first downatream velocity away from the point of extrusion while controlling the temperature of the web to an optimum value for biaxial orientation;

receiving and biaxially stretching the transported web in a continuous manner to effect biaxial orientation therein and dimension said web for subsequent forming by increasing its length and width and decreasing its thickness and continuously transporting the biaxially oriented web at a second downstream velocity away from the point of biaxial orientation;

substantially immediately and continuously transferring said biaxially oriented web into conformal engagement with an undulating rotating peripheral surface travelling at substantially said second downstream velocity to preclude loss of said orientation; and

substantially forming products from said oriented web, wherein said stress placed in the thermoplastic material by said biaxial orientation is substantially maintained from the initiation of said orientation to the forming of the products therein.

4,250,130

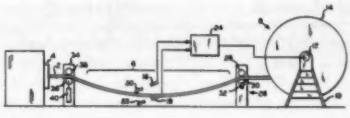
CONTROL OF PIPE TENSION BETWEEN EXTRUDER DIE AND TAKE-UP COILER

Ronald J. LaSpisa, Bartlesville, and Arthur H. McElroy, Tulsa, both of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 762,550, Jan. 25, 1977, Pat. No. 4,124,340. This application Sep. 12, 1978, Ser. No. 941,694

Int. Cl.³ B29D *23/00*

U.S. Cl. 264—40.7 **6 Claims**



1. A process for minimizing breakage and stretching of plastic pipe during production of same which comprises:

(a) extruding said pipe at a first linear rate of speed from an extruder means;

(b) establishing and maintaining a slack segment in said pipe between said extruder means and a winding means,

thereby isolating said winding means from said extruder means;

(c) establishing and maintaining a tension segment in said pipe between said slack segment and said winding means;

(d) taking up said pipe onto said winding means from said tension segment at a second linear rate of speed which is the same as or different from said first rate; wherein said pipe is taken up onto said winding means responsive to the degree of slack in said slack segment.

4,250,131

REFRACTORY INORGANIC OXIDE FIBERS

Jay E. Sobel, Des Plaines, Ill., and Vincent T. Brand, Madison, Wis., assignors to UOP Inc., Des Plaines, Ill.

Continuation of Ser. No. 307,733, Nov. 17, 1972, abandoned, which is a continuation of Ser. No. 144,296, May 17, 1971, abandoned, which is a continuation-in-part of Ser. No. 787,607, Dec. 27, 1968, abandoned. This application Jan. 15, 1979, Ser. No. 3,560

The portion of the term of this patent subsequent to Oct. 10, 1993, has been disclaimed.

Int. Cl.[3] **B28B** *3/26*

U.S. Cl. 264—56 **5 Claims**

1. A method of preparing alumina fibers by the sequential steps of:

(a) preparing a spinning solution consisting essentially of a fiberizable alumina sol by effecting a reduction in the acid anion concentration of an aqueous solution of a hydrolyzable acid salt of aluminum;

(b) admixing therewith a fiber-forming organic polymer consisting essentially of fiber-forming organic polymers which are soluble in said sol and which are selected from the group consisting of polyurethane, polyethylene oxide and polyvinyl pyrrolidone, to form a substantially liquid phase mixture, said organic polymer comprising from about 0.5 to about 25 wt. % of said mixture;

(c) concentrating said mixture to a viscosity of from about 1 to about 20,000 poise; and

(d) thereafter drawing the concentrated mixture into fibers in an atmosphere characterized by a humidity of less than about 80% and a temperature of from about 5° to about 90° C., and calcining the resulting fibers in air at a temperature of from about 300° C. to about 1000° C.

4,250,132

MATERIAL AND APPARATUS FOR EXTRUDING A CROSSLINKED POLYOLEFIN PRODUCT

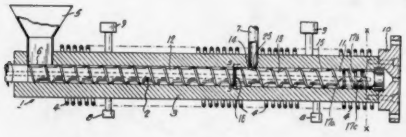
Shirley Beach, Vancouver, Canada, assignor to Phillips Cables Limited, Brockville, Canada

Division of Ser. No. 735,948, Oct. 27, 1976, Pat. No. 4,181,647, which is a continuation-in-part of Ser. No. 431,495, Jan. 7, 1974, abandoned. This application May 31, 1979, Ser. No. 44,076

Claims priority, application Canada, Jan. 11, 1973, 161082

Int. Cl.[3] **B29F** *3/10*

U.S. Cl. 264—68 **10 Claims**



1. A method of producing an electric cable conductor wire insulated with a crosslinked polyolefin insulating material in extruded form comprising:

introducing a solid particulate polyolefin into a barrel of a screw extruder, containing a screw mounted for rotation, said screw being effective to advance and shear said polyolefin,

forcing the polyolefin through the screw extruder barrel,

heating and shearing said polyolefin in an upstream portion of said barrel, passing the polymer through combined valve and mixing means which together with the temperature of the polymer is effective to convert the solid, particulate polyolefin to a polymer melt, said combined valve and mixing means comprising at least two closely spaced apart rows of radially disposed lugs mounted normal to and circumferentially around the screw to form a ring, the lugs of one of said rows being in staggered relationship with the lugs of the adjacent row,

forcing the polymer melt into a low pressure zone in the barrel and maintaining said shearing,

introducing a crosslinking agent as a dispersion in a low viscosity fluid into the polymer melt in the low pressure zone to form a mixture,

forcing the resultant mass out of the low pressure zone and into a zone of higher pressure and passing the mass through an intense mixing means; said intense mixing means comprising at least three spaced apart mixing elements diposed radially to said screw, each of said elements comprising at least a pair of adjacent rows of radially disposed lugs, the lugs of each row of a mixing element being in a staggered relationship with the lugs of the adjacent row, forcing the mixture through an extrusion head and about a moving conductor wire and

crosslinking the polyolefin with said crosslinking agent,

collecting the conductor wire insulated with extruded crosslinked polyolefin.

4,250,133

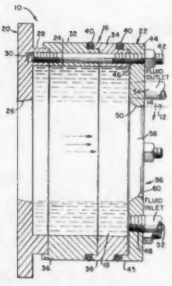
METHOD FOR FORMING AND POLISHING SOAP BILLETS

John F. Doremus, Central Valley, N.Y., assignor to Avon Products, Inc., New York, N.Y.

Division of Ser. No. 839,896, Oct. 6, 1977, Pat. No. 4,132,521. This application Aug. 15, 1978, Ser. No. 933,897

Int. Cl.[3] **B29C** *17/00*

U.S. Cl. 264—130 **3 Claims**



1. A method of continuously and automatically forming a highly polished and lustrous exterior surface on an advancing billet of material after having emerged from the nozzle of an extrusion apparatus, comprising the steps of advancing said billet into a chamber through an inlet opening and withdrawing said billet continuously from said chamber through an outlet opening, said billet upon moving through said openings serving substantially to seal said chamber, and circulating a lubricant continuously through said sealed chamber to maintain said chamber filled with lubricant whereby said lubricant is in intimate contact with the entire peripheral surface of said billet as it moves between openings, and wherein said outlet opening is smothly contoured and both configured and dimensioned to wipe said lubricant from substantially the entire peripheral surface of said billet as well as simultaneously press such peripheral surface to reduce the cross-sectional dimension

by a predetermined and permanent amount whereby said intimate contact of said moving billet and circulating lubricant, the lubricating of the peripheral surface and both the wiping and pressing of said peripheral surface at said outlet opening impart to said billet a highly polished and lustrous exterior.

4,250,134

METHOD FOR THE PRODUCTION OF CEMENTITIOUS COMPOSITIONS AND AGGREGATE DERIVATIVES FROM SAID COMPOSITIONS

L. John Minnick, Box 271, Plymouth Meeting, Pa. 19462, assignor to L. John Minnick, Cheltenham, Pa.

Filed Jun. 20, 1979, Ser. No. 50,506
Int. Cl.³ B02C *18/28*; C22B *1/243*
U.S. Cl. 264—140 **14 Claims**

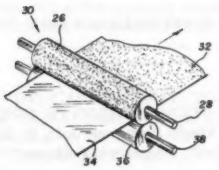
1. Method of preparing cementitious compositions comprising:
(a) collecting the spent residue from a fluidized combustion bed of the type wherein lime or limestone particles are suspended in a fluidized medium and wherein a carbonaceous fuel is ignited proximate said fluidized medium to capture therein substantial amounts of SO_x which is generated upon ignition of said carbonaceous fuel,
(b) adding water to said spent residue in sufficient quantities to substantially hydrate the lime component of said spent residue, and mixing the mixture of water and spent residue,
(c) adding a pozzolanic material to said mixture,
(d) casting the mixture produced as a result of step (c) into the desired shape, and
(e) curing the shape.

4,250,135

ROLLER FOR PRODUCING CONTINUOUS SUEDED OR GRIT TYPE FINISH AND METHOD OF MAKING

Peter C. Orsini, 81 Hemlock Dr., Paramus, N.J. 07652

Filed May 17, 1979, Ser. No. 39,962
Int. Cl.³ B29C *1/02, 15/00*
U.S. Cl. 264—227 **7 Claims**



1. A method of forming an embossing roller having an outer surface contoured to produce in and on one face of a strip of plastic sheeting a grit or suede finished surface without further finishing of said embossed surface, the method steps including:
(a) providing a support roller of metal and of a given length and of regular diameter;
(b) forming and securing an outer surface on the support roller of a selected grit surface made from externally furnished grit material, said grit surface formed of hard metal and with a substantially true representation of the externally furnished grit, said grit surface formed on the embossing roller by;
(c) applying a wet adhesive to an outer surface of a support roller;
(d) drying or curing this wet adhesive after a given depth of grit is applied to and is impressed into the wet adhesive on the support roller;
(e) covering this grit surface by a flexible covering and then curing or drying the flexible covering;
(f) removing the cured flexible covering to provide a reverse master in which is reproduced the grit projections;
(g) plating the inner surface of the reverse master to produce a plating deposition on said inner surface;
(h) securing this plating sleeve on an embossing roller to provide the desired grit formation and reproduction;
(i) mounting this roller on a shaft means and carrying this roller on said shaft for a given axial rotation;
(j) rotating said roller in a given direction and speed, and
(k) feeding said sheet material to and through opposed pair and inwardly turning rollers with the embossing roller one of the opposed pair whereby said embossing roller imparts to the sheet material a grit surface of desired depth, appearance and feel.

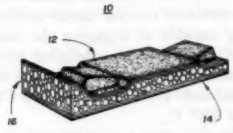
6. An embossing roller having an outer surface contoured to produce in and on one face of a strip of plastic sheeting a grit or suede finished surface without further finishing of said embossed surface, this embossing roller including:
(a) a support roller of metal of a given length and of a regular diameter to provide a base roller;
(b) an outer surface formed and secured to the support roller and having a metallic reproduction of a selected grit surface made from externally furnished grit material, said grit surface formed of hard metal and with a substantially true representation of externally furnished grit, said grit surface formed on a sleeve mounted on said support roller, the grit surface produced by plating a reverse master to provide the metallic reproduction of the grit surface on said sleeve;
(c) a shaft means by which the roller is carried for a given axial rotation;
(d) means for rotating said roller in a given direction and speed, and
(e) means for feeding said strip of sheet material to and through opposed pair and inwardly turning rollers with the embossing roller one of the opposed pair whereby said embossing roller imparts to the sheet material a grit surface of desired depth, appearance and feel.

4,250,136

METHOD OF FORMING A COMPOSITE STRUCTURE

Gary C. Rex, Troy, Mich., assignor to Composite Technology Corporation, Troy, Mich.

Filed Oct. 22, 1979, Ser. No. 86,910
Int. Cl.³ B29C *27/14*; B32B *5/16, 5/18, 17/04*
U.S. Cl. 264—257 **4 Claims**



1. The method of forming a composite structure including the steps:
A. forming a composite sandwich having:
(1) an amorphous syntactic foam core element comprising a first uncured thermosetting mixture of hollow spheres constituting 60% to 90% by volume of said element,
(2) overlaying said syntactic foam core element with enclosing layers each comprising a resilient open-cell foam containing a second uncured thermosetting resin and a fibrous reinforcing layer;
B. placing said composite sandwich within a mold;
C. actuating said mold to compress said composite sandwich with sufficient pressure to cause
(1) said composite sandwich to assume the internal shape of said mold,
(2) said open-cell foam layers to be substantially reduced in thickness whereby the open cells are substantially filled

and the fibrous reinforcing layers encapsulated with the second thermosetting resin, and

(3) the second uncured resin contained in the open-cell foam to block the flow of the first uncured resin out of the amorphous core element;

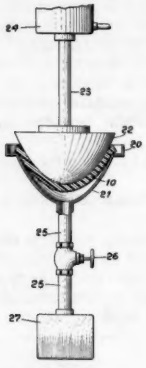
D. while maintaining said composite sandwich under pressure, applying sufficient heat to said mold to cure said thermosetting resins and thereby provide a rigid composite structure.

4,250,137

PROCESS FOR PREPARING BREAST PADS

Walter Riedler, c/o BRB Industries, Inc., 467-11th St., Hoboken, N.J. 07030

Filed Jun. 4, 1979, Ser. No. 45,236
Int. Cl.³ B29D *27/00*
U.S. Cl. 264—554 **7 Claims**



1. A process for forming a unitary, seamless breast pad from an open-cell or closed-cell polymeric foam material comprising the steps of:

(a) providing a thin, generally planar blank of said material, placing said blank between the parts of a two-part mold comprising a male mold part, and a female mold part in communication with a vacuum system capable of exerting a negative pressure on said female mold part, said mold parts being capable of engaging the inside and outside surfaces of said blank and defining between them the cross-sectional configuration of the pad being formed;

(b) heating said mold parts to a temperature within the range of 350° and 450° F.;

(c) causing the male mold part to contact the outside surface of the blank so as to deform the blank at least partially into the configuration of the female mold part, and concurrently exerting a negative pressure on said female mold part by means of said vacuum system so as to cause said blank to be seated within said female mold part;

(d) disengaging the male mold part from contact with the outside surface while continuing negative pressure to be exerted on said female mold part; and

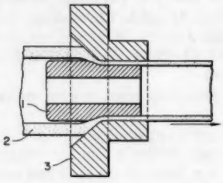
(e) causing said male mold part to again contact the outside surface of the blank while discontinuing the exertion of negative pressure on said female mold part, and applying a positive pressure to said mold parts to compress the cells of said blank and deform said blank into said configuration and applying heat to said mold parts simultaneously with said pressure, said heat being applied to the inside and outside surfaces of said blank, said heat penetrating substantially completely through the cells of said blank to cause said cells to become permanently reformed into their compressed positions.

4,250,138

PROCESS FOR PRODUCING MICROPOROUS TUBES OF POLYTETRAFLUOROETHYLENE

Koichi Okita, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Division of Ser. No. 832,267, Sep. 12, 1977, Pat. No. 4,177,334.
This application May 23, 1979, Ser. No. 41,586
Claims priority, application Japan, Sep. 13, 1976, 51-110536
Int. Cl.³ B29D *23/01, 27/08*
U.S. Cl. 264—568 **3 Claims**



1. A process for producing microporous tubes which comprises

molding a polytetrafluoroethylene resin containing a liquid lubricating agent by a paste method to form a tube,

removing the liquid lubricating agent,

stretching by drawing the tube in a lengthwise direction using a die and a plug, and

sintering at a temperature of about 327° C. or more

whereby as a result of said stretching and said drawing, a microporous tube is produced having a porosity and a bubble point in a range between the point A, B, C and D defined in the following table;

	porosity	bubble point
A	96%	0.02 kg/cm²
B	54%	2.0 kg/cm²
C	20%	2.0 kg/cm²
D	30%	1.0 kg/cm²

and having a ratio of wall thickness to inside diameter of about 0.1 or less.

4,250,139

MICROWAVE STERILIZATION OF DRY PROTEIN

Edward E. Luck, Menlo Park, and John R. Daniels, Portola Valley, both of Calif., assignors to Collagen Corporation, Palo Alto, Calif.

Filed Feb. 1, 1979, Ser. No. 8,652
Int. Cl.³ C12N *13/00;* **A23L** *3/10, 3/16;* **A61L** *2/12*
U.S. Cl. 422—21 **9 Claims**

1. A method for disinfecting a host protein having physiological properties for use in a mammalian host without significantly affecting the physiological, chemical and physical properties of said host protein, said method comprising applying to said host protein substantially freed of water a lethal dosage of microave energy at a temperature above ambient temperature and below about 75° C. and for a time sufficient to decontaminate said host protein.

4,250,140

METHOD AND COMPOSITION FOR RETARDING WATER EVAPORATION

John J. Rowlette, Arcadia, Calif., assignor to Duane D. Erway, South Pasadena, Calif., a part interest

Division of Ser. No. 444,827, Feb. 22, 1974, Pat. No. 4,162,990.
This application Apr. 27, 1979, Ser. No. 33,975
Int. Cl.³ B01J *1/18*
U.S. Cl. 422—43 **12 Claims**

1. A method for forming thin films of evaporation retarding

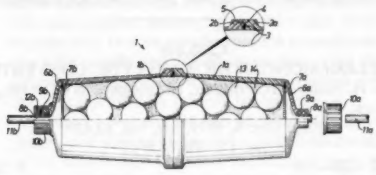
agents upon a water surface, the method comprising the step of applying to the water surface a mixture of separated particles of a saturated aliphatic interface-active hydrocarbon in solid solution with a spreading agent that is soluble in water and in the hydrocarbon, the mixture having a sufficiently small specific gravity to float on water.

4,250,141

COLUMN FOR THE REMOVAL OF UNDESIRED SUBSTANCES FROM A LIQUID MIXTURE

Hans-Dieter Lehmann, and Peter Konstantin, both of Hechingen, Fed. Rep. of Germany, assignors to Gambro Dialysatoren GmbH & Co. KG, Fed. Rep. of Germany

Filed Dec. 15, 1978, Ser. No. 969,847
Claims priority, application Sweden, Dec. 16, 1977, 7714336
Int. Cl.[3] A61M *1/03;* B01D *15/04*
U.S. Cl. 422—44 **15 Claims**



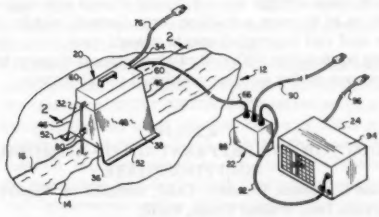
1. A column for removal of undesired substances from a liquid mixture, comprising an outer casing having an inlet and an outlet for the liquid mixture; filler particles partially filling said casing, which filler particles are substantially inactive to said liquid mixture; and active granules filling the remainder of said casing, said active granules being capable of removing said undesired substances from said liquid mixture as said liquid mixture passes through said casing from said inlet to said outlet and being formed of a material selected from the group consisting of adsorbing material and ion-exchanging material, wherein said filler particles are substantially larger than said active granules and wherein said filler particles are in fixed contact relationship with each other and extend from said inlet to said outlet with said active granules essentially completely filling in spaces between said filler particles.

4,250,142

VOLATILE HYDROCARBON DETECTOR APPARATUS

Klaus E. Kollmai, 2824 S. Osage, Wichita, Kans. 67217

Filed Apr. 6, 1979, Ser. No. 27,743
Int. Cl.[3] G01N *27/16, 31/12*
U.S. Cl. 422—68 **5 Claims**



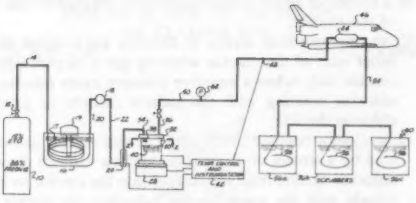
1. A volatile hydrocarbon detector apparatus, comprising:
(a) a gas sampler assembly having a hood housing assembly to straddle an open stream of continually flowing liquid material moved by a power source suspected of containing a hydrocarbon gas therein;
(b) said gas sampler assembly includes a sensing head assembly mounted in said hood housing assembly having a sensor head member to receive hydrocarbon gas and generate a first output signal therefrom with the strength of said first output signal dependent on the amount of hydrocarbon gas present;
(c) a recorder assembly connected to said sensor head member to receive said first output signal therefrom to continuously indicate the amount of hydrocarbon gas in said stream of flowing liquid material;
(d) said gas sampler assembly includes a pump assembly;
(e) said pump assembly includes an air discharge assembly; and
(f) said air discharge assembly includes a discharge head adapted to be submerged in said stream of flowing liquid material to supply air under pressure thereto to aid in release of any hydrocarbon gas therein for detection by said sensor head member.

4,250,143

SYSTEM FOR STERILIZING OBJECTS

Coleman J. Bryan, Merritt Island; Edward E. Wright, Jr., Titusville, and Clyde V. Moyers, Cape Canaveral, all of Fla., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 8, 1979, Ser. No. 46,739
Int. Cl.[3] A61L *2/08, 9/00;* G05D *23/00*
U.S. Cl. 422—109 **3 Claims**



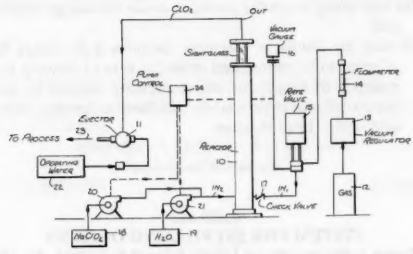
1. A system for producing a humidified sterilizing gas mixture for sterilizing an object comprising:
(a) means for supplying a pressurized sterilant gas;
(b) a mixing chamber having a closed top and bottom;
(c) inlet and outlet ports provided in said top of said mixing chamber;
(d) water carried in said mixing chamber with the level of said water only partially filling said mixing chamber so as to provide an empty space adjacent the top of the chamber;
(e) a hot plate heating said water in said chamber to a predetermined temperature producing a humidified atmosphere in said empty space;
(f) means for feeding said sterilant gas through said inlet port;
(g) an arcuate shaped elongated tube connected to said inlet port and extending into said empty space of said chamber for producing a vortex type of flow of sterilant gas in said chamber through said humidified atmosphere so as to be humidified;
(h) tubular means connected to said outlet port for conveying said humidified sterilant gas to said object for sterilizing said object,
(i) a temperature and humidity sensor carried in said tubular means connected to said outlet port;
(j) temperature and humidity control means connected to said temperature and humidity sensor, said mixing chamber, and said hot plate for maintaining said humidified sterilizing gas at a predetermined degree of relative humidity.

4,250,144

CHLORINE DIOXIDE GENERATING SYSTEM

Brian J. Ratigan, Philadelphia, Pa., assignor to Fischer & Porter Company, Warminster, Pa.

Filed Jun. 14, 1979, Ser. No. 48,633
Int. Cl.³ G05B *9/00*; F16K *31/12*; G05D *7/00*; C01B *11/02*
U.S. Cl. 422—112 **8 Claims**



1. A chlorine dioxide generating system for treating a process with chlorine dioxide that is substantially free of chlorine comprising:

A. a reactor having two inlets and an outlet, the reactor being constituted by a vertically-positioned packed column, said inlets being at the bottom and said outlet being at the top of the column;

B. a supply of aqueous sodium chlorite coupled to one inlet of the reactor;

C. an unpressurized supply of chlorine gas coupled to the other inlet of the reactor whereby gas is drawn into the reactor only when a negative pressure exists therein, the chlorine reacting with the sodium chlorite to generate chlorine dioxide;

D. an ejector coupled to the outlet of said reactor and operated by a stream of water to produce a vacuum drawing chlorine dioxide from the reactor into the ejector to intermingle with the water stream, whereby the ejector discharges a dilute solution of chlorine dioxide for feeding to the process to be treated, the resultant negative pressure in the reactor drawing chlorine gas therein; and

E. a vacuum regulator interposed between the other inlet to the reactor and the chlorine gas supply to effectively disconnect said supply from said reactor in the absence of a negative pressure therein, said regulator supplying chlorine gas at a predetermined constant flow rate to the reactor within a range of negative pressure values, said predetermined constant flow rate being independent of the negative pressure value.

4,250,145

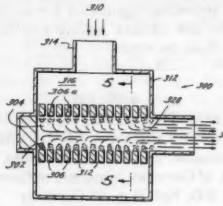
CARBON BLACK REACTOR WITH IMPROVED BURNER

David F. Pobst, Jr., Big Spring, and Jesse M. Bailey, Jr., Odessa, both of Tex., assignors to Sid Richardson Carbon & Gasoline Co., Fort Worth, Tex.

Filed Jun. 8, 1978, Ser. No. 913,833
Int. Cl.³ C09C *1/00, 3/00*
U.S. Cl. 422—151 **13 Claims**

1. In a carbon black reactor of the type having a burner section for combusting a pre-mixture of fluid fuel and oxygen gas to create hot combustion gases within said reactor for thermally decomposing a hydrocarbon feedstock into carbon black and waste gas, the improvement which comprises:

a flameholder in said burner section adapted to produce non-streamlined flow of said mixture of fluid fuel and oxygen gas therethrough, said flameholder comprising a plurality of non-streamlined bodies spaced substantially equidistant from each other to provide a plurality of elongated parallel orifices of approximately equal thicknesses; and



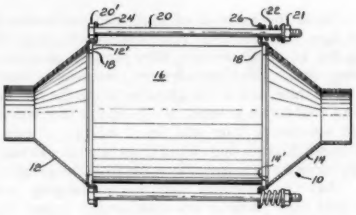
plenum means for supplying said premixture of fluid fuel and oxygen gas through said elongated parallel orifices to produce parallel jets of said premixture for combustion.

4,250,146

CASELESS MONOLITHIC CATALYTIC CONVERTER

Charles H. Bailey, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Oct. 5, 1979, Ser. No. 82,437
Int. Cl.³ F01N *3/10*
U.S. Cl. 422—179 **3 Claims**



1. A caseless catalytic converter assembly comprising a first end support member; a ceramic, monolithic catalyst support element having a plurality of parallel flow channels therein; a second end support member; at least one generally annular gasket member overlying a portion of at least one of said end support members; said catalyst support element being positioned between said first and second end support members and in sealing engagement with said at least one gasket member; a plurality of at least three fastening members and at least three springs mounted in a uniformly spaced manner around the outer surface of said catalyst support element, said fastening members and springs being mounted to said end support elements so as to exert a resilient force thereon which tends to draw said end support elements toward each other and into sealing relationship with said catalyst support element and said at least one gasket element positioned therebetween.

4,250,147

REACTOR FOR PREPARATION OF AMMONIUM POLYPHOSPHATE

William C. Jensen, Concord, Calif., assignor to Western Farm Services Inc., Walnut Creek, Calif.

Division of Ser. No. 948,722, Oct. 5, 1978, Pat. No. 4,211,546. This application Jan. 7, 1980, Ser. No. 110,158
Int. Cl.³ B01J *10/00*; F28D *7/02*
U.S. Cl. 422—189 **1 Claim**

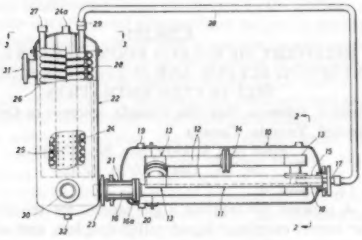
1. A reactor for ammoniation of wet process phosphoric acid having a low polyphosphate content to an ammonium polyphosphate having a high proportion of the total P_2O_5 in the polyphosphate form which comprises:

(a) a first reaction stage comprising:

(1) an elongated tubular jacket containing a bundle of longitudinally disposed tubes, each tube except at the bundle inlet and outlet ends being connected at each end to an adjacent tube by a tube connecting means so that a single continuous flow passage is formed by the internal hollow portion of said tubes and tube connecting means thereby providing a tubular reaction zone for cocurrent contacting and reaction of phosphoric acid and anhydrous ammonia, the inlet end of said tube bundle being located inside the tubular jacket and the outlet end of said tube bundle extending through and being affixed to said tubular jacket thereby providing an outlet for withdrawing the ammoniation reaction mass from the first reaction stage;

(2) an inlet for providing preheated, anhydrous ammonia to the tubular reaction zone, said inlet being in the form of a pipe which extends through the tubular jacket into the inlet end of the tube bundle, said pipe having the same longitudinal axis as, and a smaller diameter than, the tube portion making up the inlet end of the tube bundle such that an annular space is provided between the tube bundle and the ammonia inlet pipe for fluid communication between the tubular reaction zone and the space defined by the tubular jacket;

(3) an inlet for wet process phosphoric acid in the tubular jacket, said inlet being located remote from the inlet end of the tube bundle such that incoming phosphoric acid contacts a substantial portion of the external surface of the tube bundle and is thereby preheated prior to its



entry into the tubular reaction zone via the annular space between the inlet end of the tube bundle and the ammonia inlet pipe; and

(b) a second reaction stage comprising:

(1) a vertically oriented reaction chamber having an inlet in its lower portion for introduction of the ammoniation reaction effluent from the first reaction stage, said reaction chamber being closely connected to the first reaction stage by a conduit through which the first stage tubular reactor passes which provides fluid communication between the two reaction stages;

(2) a tubular heat exchanger means which extends substantially into the ammoniation reaction mass contained in the reaction chamber, said tubular heat exchange means being connected to an external source of liquid or vaporized anhydrous ammonia such that the ammoniation reaction mass contained in the reaction chamber is cooled by heat transfer through the heat exchanger wall and the ammonia coolant contained therein is vaporized and preheated;

(3) a means for sparging sufficient ammonia in liquid or vapor form required for the final nitrogen to phosphate ratio into the ammoniation reaction mass contained in the reaction chamber, said means being connected to an external source of ammonia and extending substantially below the surface of the ammoniation reaction mass in the reaction chamber whereby the pH of the ammoniation reaction mass is increased and the reaction mass is agitated for increased heat exchange with the ammonia contained in the tubular heat exchange; and

(4) an inlet to the reaction chamber for the recycle of ammoniated reaction product cooled by external means to the reaction chamber to control the temperature of the ammoniation reaction mass in the reaction chamber, said inlet being located in the lower portion of the reaction chamber such that the recycle product mixes with the ammoniation reaction effluent from the first reaction stage and flows vertically over the tubular heat exchanger and sparger prior to being discharged; and

(5) an outlet in the reaction chamber for the ammoniated reaction product, said outlet being located in the upper portion of the reaction chamber at a point above the sparger and the major portion of the tubular heat exchanger; and

(c) a conduit connecting the effluent end of the tubular heat exchanger means in the second stage reaction chamber and the anhydrous ammonia inlet pipe in the first reaction stage whereby preheated, anhydrous ammonia vapor can be passed to the first reaction stage.

4,250,148

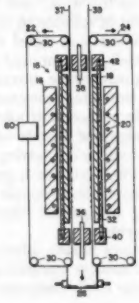
APPARATUS AND METHOD FOR PRODUCING POLYCRYSTALLINE RIBBON

Mario E. Cota, Scottsdale, and Richard W. Gurtler, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 18, 1978, Ser. No. 925,734

Int. Cl.[3] **B01D** *9/00*

U.S. Cl. 422—246 **7 Claims**

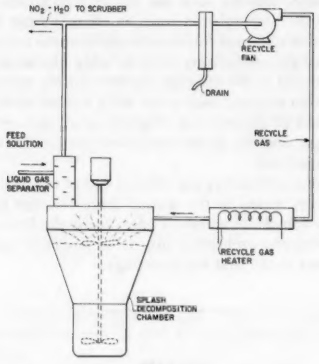


1. An apparatus for the formation of polycrystalline ribbon on elongated foil members and for the subsequent separation therefrom comprising in combination: a plurality of elongated foil members, each having two major surfaces; a furnace having input and output ends and capable of being heated to an elevated temperature; means for moving said foil members through the furnace; guide means for positioning the moving foil members to bound a reaction volume in the furnace, a first of said major surfaces of each of said foils facing said reaction volume; means for providing silicon bearing reactant vapors in the reaction volume bounded by said foil members wherein the vapors can react at the elevated temperature to deposit silicon on first of said major surfaces of each of said elongated foil members facing said reaction volume, said positioning of said foil members inhibiting deposition of silicon on said second of said surfaces; vapor sealing means located proximate the input and output ends and able to maintain a controlled ambient in the furnace while allowing the moving of the foil members; and means for separating the silicon from the elongated foil members.

4,250,149
MANGANESE NITRATE DECOMPOSITION

Jay Y. Welsh, Catonsville, Md., assignor to Chemetals Corporation, Baltimore, Md.

Filed May 15, 1979, Ser. No. 39,115
Int. Cl.[3] C01G 45/02
U.S. Cl. 423—50 10 Claims



1. A method for decomposing manganese nitrate in an aqueous solution or slurry containing alkali and/or alkaline earth nitrates, comprising the steps of:

(a) splashing said aqueous solution containing manganese nitrate to propel droplets or sheets of solution into a hot atmosphere above the aqueous solution or slurry,

(b) heating said droplets or sheets of aqueous solution in said hot atmosphere above the aqueous solution or slurry to remove a portion of the water and partially decompose each droplet or sheet of solution to form manganese dioxide and nitrogen dioxide and water vapor, and

(c) reuniting said partially decomposed droplets or sheets of solution containing manganese dioxide with said aqueous solution or slurry containing manganese nitrate by allowing said partially decomposed droplets or sheets of solution containing manganese dioxide to fall down into said aqueous solution or slurry containing manganese nitrate.

8. The method according to claim 1, including:

(d) separating said manganese dioxide from said aqueous solution containing manganese nitrate, and recovering said manganese dioxide,

(e) spraying said aqueous nitrate solution containing about 0.5 to 0.8 grams of soluble manganese per gram of total alkali and/or alkaline earth compounds to form droplets of solution,

(f) heating said droplets of solution to fully decompose each droplet to form a fluid product slurry containing nonstoichiometric manganese dioxide, and nitrogen dioxide, and

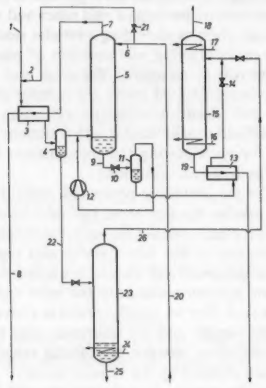
(g) recovering said fluid product slurry containing nonstoichiometric manganese dioxide.

4,250,150
PROCESS FOR THE TREATMENT OF GASEOUS MIXTURES, WHICH CONTAIN SOUR GASES, WITH ORGANIC SOLVENTS

Heinz Karwat, Pullach; Roland Lang, Wolfratshausen, and Wolfgang Jelend, Munich, all of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Jan. 2, 1979, Ser. No. 213
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1977, 2759123; Dec. 30, 1977, 2759124
Int. Cl.[3] B01D 53/34
U.S. Cl. 423—226 11 Claims

1. A process for preventing corrosion caused by the formation of iron pentacarbonyls and sulfur-containing iron carbonyls, of apparatus made of iron or normal steel and occuring during the treatment of a gaseous mixture containing carbon monoxide and hydrogen sulfide with an aqueous alcoholic solution acting as a physical absorbent, comprising conducting



the treatment in the presence of at least one alkaline-reacting inorganic compound selected from the group consisting of ammonia and sodium hydroxide thereby substantially preventing the formation of said iron pentacarbonyls and carbonyls.

4,250,151
RECOVERY OF SULFUR FROM GAS STREAMS CONTAINING SULFUR AND SULFUR COMPOUNDS IN DILUTE CONCENTRATION

Herbert S. Johnson, Oakville, Canada, assignor to Gulf Canada Limited, Toronto, Canada

Filed Sep. 4, 1979, Ser. No. 72,389
Int. Cl.[3] C01B 17/16, 17/00
U.S. Cl. 423—230 9 Claims

1. A process for treating a gas stream for the removal of sulfur vapor, entrained liquid sulfur droplets, and admixtures of hydrogen sulfide and sulfur dioxide, present in dilute concentration in said gas stream, which comprises intimately contacting the gas stream with an acidic aqueous suspension of at least 1%, by weight of the suspension, of a finely divided catalytic material of the group alumina and activated carbon, the acidity of said suspension being that generated by absorption of acidic components of the gas stream, to deposit sulfur values from the gas stream as solid sulfur absorbed on the catalytic material.

4,250,152
SULFUR DIOXIDE SCRUBBER WITH HYROCLONE SEPARATOR

Edward L. Biedell, Scotch Plains, and Robert J. Ferb, Warren, both of N.J., assignors to Research-Cottrell, Inc., Somerville, N.J.

Filed Nov. 6, 1978, Ser. No. 957,674
Int. Cl.[3] C01B 17/00
U.S. Cl. 423—242 2 Claims

1. A method of removing sulfur dioxide from flue gas comprising the steps:

(a) serially quenching and then scrubbing the hot flue gas with a water slurry of an alkali reagent;

(b) collecting the partially spent alkali reagent from the scrubbing step;

(c) separating the collected partially spent alkali reagent into a heavy fraction and a light fraction;

(d) returning the light fraction for use in the scrubbing step;

(e) utilizing the heavy fraction as a portion of the quenching liquid;

(f) separately collecting the liquid discharging from the quenching step;
(g) subjecting a portion of the collected quenching liquid to centrifugal force to separate the liquid into a light fraction consisting primarily of water and calcium sulfite and a heavy fraction consisting primarily of calcium sulfate;
(h) utilizing the light fraction from step (g) as a portion of the quenching liquid; and
(i) disposing of the heavy fraction from step (g).

4,250,153

FLUE GAS TREATMENT

Peter Urban, Northbrook, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jun. 11, 1979, Ser. No. 47,606
Int. Cl.³ C01B *17/00*
U.S. Cl. 423—242 **9 Claims**

1. In a process for the absorptive removal of sulfur dioxide from a gaseous mixture by contacting said gaseous mixture in a scrubbing zone with a scrubbing liquor comprising a buffered solution of an alkali metal sulfite and bisulfite, the alkalinity of said scrubbing liquor being maintained by the addition thereto of an aqueous alkaline reagent solution comprising sodium carbonte, sodium bicarbonate or a mixture of both having a relatively high pH with respect to said scrubbing liquor, said aqueous alkaline reagent solution having dissolved therein an undesirable quantity of silica contaminant which, upon the addition of said aqueous alkaline reagent solution to said scrubbing liquor, tends to precipitate from solution and form deleterious deposits which interfere with the functioning of said process, said interference being minimized by the addition of a water soluble salt of a metal selected from the group consisting of iron, cobalt, nickel, copper and aluminum to said aqueous alkaline reagent solution prior to the addition of said aqueous alkaline reagent solution to said scrubbing liquor thereby effecting a chemical reaction between said silica and said salt to obtain a silicon containing material having a minimum deleterious effect when precipitated, the improvement which comprises the lowering of the pH of said aqueous alkaline reagent solution about 0.5 to about 1.5 pH numbers prior to said addition of said water soluble salt to said aqueous alkaline reagent solution, thereby minimizing the amount of said water soluble salt required for said reaction with said silica.

4,250,154

RE-POST PRECIPITATION CONTROL

Richard N. Hill, Lakeland, Fla., assignor to W. R. Grace & Co., New York, N.Y.

Filed Oct. 22, 1979, Ser. No. 86,640
Int. Cl.³ C01B *25/16*
U.S. Cl. 423—317 **6 Claims**

1. The method of preventing re-post precipitation in a wet process phosphoric acid analyzing about 57–63% P_2O_5 prepared by steps including treatment of 26–36% P_2O_5 acid with aluminum silicate followed by concentration to about 50%, removal of solids, and further concentration to 57–63%, with post precipitation of solids in an amount of 5 to 100% based on the total volume of acid plus solids, comprising heating the solids-containing 57–63% acid to a temperature in the range of about 55°to 85° C, whereupon the solids largely redissolve without subsequent re-precipitation.

4,250,155

METHOD OF PURIFYING PHOSPHORIC ACID AFTER SOLVENT EXTRACTION

Anastasios P. Kouloheris, and JoAnne LeFever, both of Brandon, Fla., assignors to Gardinier, Inc., Tampa, Fla.

Filed Jun. 9, 1978, Ser. No. 914,289
Int. Cl.² C01B *25/16*
U.S. Cl. 423—321 R **13 Claims**

1. A method of purifying phosphoric acid after a solvent extraction process, comprising:
contacting phosphoric acid containing residual organic carrier after a solvent extraction process with a gypsum sorbent which sorbs said residual organic carrier,
sorbing said residual organic carrier on said gypsum sorbent to form organic carrier-laden sorbent and,
separating said organic carrier-laden sorbent from said phosphoric acid, thereby purifying said phosphoric acid after solvent extraction.

4,250,156

PROCESS FOR PREPARING CARBONYL SULFIDE

Nobuo Takahashi, Shizuoka; Masamichi Shimizu, Abiko; Kazushige Hirao, Hamamatsu, and Sadayoshi Matsui, Shimizu, all of Japan, assignors to Ihara Chemical Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 67,666, Aug. 20, 1979, abandoned. This application Mar. 19, 1980, Ser. No. 131,668
Int. Cl.³ C01B *31/26*
U.S. Cl. 423—416 **10 Claims**

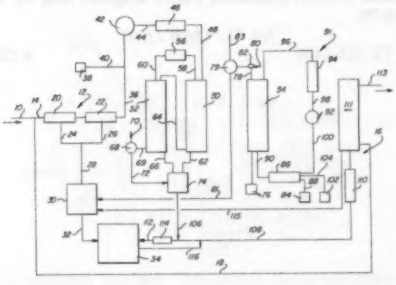
1. A process for preparing carbonyl sulfide wherein carbon monoxide is reacted with sulfur in the vapor phase, which comprises the steps of:
causing carbon monoxide to bubble through molten sulfur maintained at a temperature of from 300° to 440° C., and;
maintaining the resulting gaseous mixture at a temperature exceeding 510° C. but not higher than 650° C.

4,250,157

METHOD AND APPARATUS FOR ENRICHING THE IRON CARBONYL CONTENT OF A RECYCLE GAS STREAM

Richard P. Ruskin, Houston, Tex.; Humayon Z. Zafar, Wichita, Kans.; Duane N. Goens, Golden, Colo.; David E. Hyatt, Wheatridge, Colo., and Charlie W. Kenney, Lakewood, Colo., assignors to Pentanyl Technologies, Inc., Arvada, Colo.

Filed Apr. 11, 1980, Ser. No. 139,422
Int. Cl.³ C01G *49/16*; C21B *15/04*
U.S. Cl. 423—417 **15 Claims**



1. A process for enriching the iron carbonyl content of a recycle gas stream comprising carbon monoxide and produced in an iron carbonyl decomposition or reaction process to enable reuse of the recycle gas stream in the iron carbonyl decomposition or reaction process, comprising:
cooling an iron carbonyl lean recycle gas stream produced in an iron carbonyl decomposition process to a temperature of about 5° to about 15° C.;
adding carbon monoxide to the cooled recycle gas stream to produce a carbon monoxide enriched gas stream;
compressing the carbon monoxide enriched gas stream to a pressure of about 20 to about 38 atmospheres under conditions suitable to prevent the decomposition of substantial amounts of the iron carbonyl in the carbon monoxide enriched recycle gas stream; and
contacting the compressed gas stream at a temperature of about 65° to about 160° C. with a reduced iron containing

material in the presence of an iron carbonyl production enhancing amount of hydrogen sulfide to produce substantially condensed iron carbonyl.

4,250,158

PROCESS FOR RECOVERING CARBON BLACK AND HYDROCARBONS FROM USED TIRES

Age Solbakken, Montgomery; Fred P. Apffel, Houston; Sam P. Robinson, Houston, and Bobby L. Hayes, Houston, all of Tex., assignors to Intenco, Inc., Houston, Tex.

Filed Feb. 15, 1978, Ser. No. 878,088
Int. Cl.[3] C01B *31/02*; C09C *1/48*
U.S. Cl. 423—449 **30 Claims**

1. A process for manufacturing carbon black and hydrocarbons from discarded tires, comprising;

disintegrating the tires to reduce the tires to fragments;

pyrolyzing the fragments in a pyrolysis reaction vessel at a temperature and pressure and for a reaction time sufficient to cause the fragments to dissociate into a vapor phase and a solid phase;

condensing a high boiling point condensate containing reactor effluent particulate from a portion of the vapor phase at a process stream;

feeding at least a first portion of such high boiling point condensate process stream containing effluent particulate from the reactor obtained by said condensing of a portion of the vapor phase back into the pyrolyzing solid phase;

fractionating a second portion of the vapor phase to produce hydrocarbon fractions;

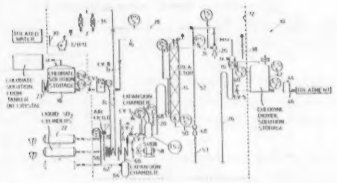
said pyrolyzing step including indirectly, internally heating the fragments in the reactor with molten salt and, producing carbon black from the solid phase.

4,250,159

SMALL SCALE CHLORINE DIOXIDE PLANT

Gerald Cowley, Mississauga, Canada, assignor to ERCO Industries Limited, Islington, Canada

Filed Apr. 25, 1980, Ser. No. 143,888
Claims priority, application United Kingdom, May 31, 1979, 19026/79
Int. Cl.[3] C01B *11/02*
U.S. Cl. 423—480 **8 Claims**



1. A process for the production of an aqueous solution of chlorine dioxide, which comprises:

feeding a preheated aqueous solution of sodium chlorate having a temperature of about 50° to about 60° C. to an upper end of an upright gas-liquid contact reaction zone,

feeding a preheated stream of gaseous sulphur dioxide having a temperature of about 50° to about 60° C. to a lower end of said upright gas-liquid contact reaction zone,

countercurrently contacting downwardly-flowing sodium chlorate solution and upwardly-flowing gaseous sulphur dioxide in said reaction zone to cause reaction therebetween at a temperature of about 50° to about 80° C. and in an aqueous acid reaction medium at a total acid normality of about 9.5 to about 11 normal to form gaseous chlorine dioxide,

subjecting said reaction zone to a subatmospheric pressure of about 80 to about 100 mm Hg and greater than the pressure at which the reaction medium boils to withdraw said gaseous chlorine dioxide therefrom at said upper end of said reaction zone,

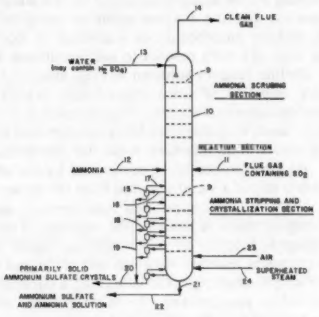
contacting said withdrawn gaseous chlorine dioxide with water at a temperature of about 5° to about 25° C. to dissolve said chlorine dioxide therein at a flow rate of water sufficient to form an aqueous chlorine dioxide solution having a dissolved chlorine dioxide concentration of less than about 3 g/l.

4,250,160

PRODUCTION OF AMMONIUM SULFATE

James M. Eakman, Houston, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 700,738, Jun. 29, 1976, abandoned. This application Aug. 15, 1977, Ser. No. 824,456
Int. Cl.[3] C01C *1/24*; C01B *17/00*
U.S. Cl. 423—547 **9 Claims**



1. A process for simultaneously producing ammonium sulfate and removing sulfur dioxide from a sulfur dioxide-containing gas in a distillation column comprised of an upper ammonia scrubbing zone, a central reaction zone, and a lower stripping and crystallization zone that contains at least one vapor-liquid contact tray which comprises:

(a) introducing a sulfur dioxide-containing gas and ammonia into said central reaction zone wherein sulfur dioxide, ammonia, water and oxygen react to form an ammonium sulfate-containing solution which flows downward into said lower stripping and crystallization zone;

(b) introducing water into the upper ammonia scrubbing zone of said distillation column, said water scrubbing the ascending gases as it flows downward into said central reaction zone;

(c) withdrawing a substantially ammonia and sulfur dioxide-free gas overhead from said distillation column;

(d) introducing an oxygen-containing gas into the bottom of the lower stripping and crystallization zone of said distillation column;

(e) supplying heat to said distillation column;

(f) withdrawing a slurry stream of liquid and ammonium sulfate solids from each vapor-liquid contact tray on which such a slurry exists in said lower stripping and crystallization zone;

(g) separating a substantial portion of said ammonium sulfate solids from each slurry stream withdrawn from each vapor-liquid contact tray to produce a liquid stream depleted in ammonium sulfate solids; and

(h) returning each liquid stream produced from each slurry stream in step (g) to the vapor-liquid contact tray from which the slurry stream was originally withdrawn.

4,250,161
METHOD AND KIT FOR THE PREPARATION OF RADIOPHARMACEUTICALS

Marc de Schrijver, Rosenau, France, assignor to Solco Basel AG, Basel, Switzerland

Filed Sep. 6, 1978, Ser. No. 939,923

Claims priority, application Switzerland, Sep. 8, 1977, 11027/77

Int. Cl.³ A61K *43/00, 49/00*

U.S. Cl. 424—1 **11 Claims**

1. A method of preparing radiopharmaceuticals with the isotope-99m, comprising mixing (a) an aqueous solution of the chemical substance to be labelled, (b) the amount of pertechnetate calculated for the labelling and (c) an aqueous suspension of a reducing agent selected from the group consisting of $Sn_2Fe(CN)_6$, $Sn_3[Fe(CN)_6]_2$, tin(II)-sulfide and tin(II)-telluride, in an amount which in respect of the reduction of the pertechnetate ions of the formula TcO_4^- to technetium ions with lower valency represents an excess, wherein (a), (b) and (c) are mixed together in such a way that either the pertechnetate (b) or the suspension (c) is added last; keeping the two-phase system obtained in suspension until after completion of the reduction of the pertechnetate, the separating the solid phase from the solution containing the chemical substance labelled with technetium-99m.

4,250,162
PROTEIN BINDING METHOD

Ernest V. Groman, Brookline, Mass., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jul. 2, 1979, Ser. No. 54,080

Int. Cl.³ G01N *33/56, 33/78*

U.S. Cl. 424—1 **15 Claims**

1. In a method for determining the concentration of an analyte in a sample wherein the sample is extracted with a substantially water immiscible organic solvent, the solvent removed from the extract and the extract assayed by a specific protein binding assay, the improvement comprising removing the solvent from the extract while the solvent is in contact with a surface-absorbed binding protein specific for said analyte.

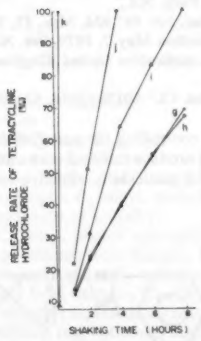
4,250,163
METHOD AND PREPARATION FOR ADMINISTRATION TO THE MUCOSA OF THE ORAL OR NASAL CAVITY

Tsuneji Nagai, Chofu; Yoshiharu Machida, Kawasaki; Yoshiki Suzuki, and Hiroshi Ikura, both of Hino, all of Japan, assignors to Teijin Limited, Japan

Division of Ser. No. 17,059, Mar. 2, 1979. This application Dec. 13, 1979, Ser. No. 103,558

Int. Cl.³ A61K *31/74, 31/78*

U.S. Cl. 424—14 **9 Claims**



1. In a method for administering a medicament which comprises adhering with a polyacrylate to the mucosa of the oral cavity a pharmaceutical preparation, the improvement comprising adhering said medicament with

(a) a water-swellable and mucosa-adhesive polymeric matrix comprising about 50 to about 95% by weight of a cellulose ether and about 50 to about 5% by weight of a homo- or copolymer of acrylic acid or pharmaceutically acceptable salt thereof, and

(b) dispersed therein, a pharmaceutically effective amount of the medicament to be adhered to the oral mucosa,

said preparation releasing continuously the medicament at a controlled rate; and causing the released medicament to be absorbed through the mucosa or enterally.

4,250,164
METHOD OF TREATING PSORIASIS OF THE NAILS AND COMPOSITION

Joel E. Bernstein, 615 Brierhill Rd., Deerfield, Ill. 60015

Filed Apr. 9, 1979, Ser. No. 28,092

Int. Cl.³ A61K *7/04, 31/58*

U.S. Cl. 424—61 **8 Claims**

3. A method of treating psoriatic nails comprising periodically applying to said psoriatic nails nail polish containing an effective amount of fluorinated corticosteroid selected from the group consisting of betamethasone valerate and fluorandrenolide.

6. An antipsoriatic nail polish composition comprising nail polish containing an effective amount of a topically active corticosteroid effective against psoriasis.

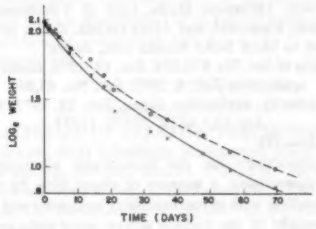
4,250,165
METHOD OF STABILIZING FRAGRANCE OILS

Lary L. Foley, San Francisco, Calif., assignor to The Clorox Company, Oakland, Calif.

Continuation of Ser. No. 782,565, Mar. 29, 1977, abandoned. This application Nov. 20, 1978, Ser. No. 962,487

Int. Cl.³ A61K *7/46;* **A61L** *13/00*

U.S. Cl. 424—76 **10 Claims**



1. A stabilized fragrance formulation consisting essentially of fragrance oils in combination with with an alkylphenoxy polyethoxy alcohol present in an amount of from about 5 to 95% by weight of the total formulation, and wherein there are from 9 to 12 ethylene oxide moieties on the average in the polyethoxy chain which forms the polyethoxy portion of the alkyl phenoxy polyethoxy alcohol.

4,250,166
LONG ACTING PREPARATION OF CEFALEXIN FOR EFFECTIVE TREATMENTS OF BACTERIAL INFECTION SENSITIVE TO CEFALEXIN

Hideyuki Maekawa, Osaka; Yasushi Takagishi, Nishinomiya, and Hiroshi Kato, Kobe, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed May 27, 1977, Ser. No. 801,402

Int. Cl.³ A61K *31/78, 31/54*

U.S. Cl. 424—81 **14 Claims**

1. A long-acting cefalexin preparation which comprises

normal cefalexin which dissolves rapidly in the stomach, and coated particulate cefalexin which does not dissolve in the stomach but dissolves rapidly in the upper intestine, wherein the said coated portion is coated with a copolymer of methylmethacrylate and methacrylic acid which has a dissolution pH of from 5.5 to 6.5, and wherein the potency ratio of the normal cefalexin to the coated portion is between 40:60 and 25:75.

4,250,167

METHODS FOR REDUCING CALCIUM DEPOSITS

Elgan A. Davis, 7103 Marconi St., Huntington Park, Calif. 90255

Filed Sep. 19, 1978, Ser. No. 943,732
Int. Cl.[3] A61K *37/48*
U.S. Cl. 424—94 **10 Claims**

1. The method of reducing a deposit of inert calcium beneath the skin that comprises:

applying to the skin a composition containing intermixed effective amounts of dimethyl sulfoxide and papain;

conveying said papain into the skin and to the location of the calcium deposit by action of said dimethyl sulfoxide; and

reducing the calcium deposit by action of said papain.

4,250,168

COLD SORE TREATMENT METHOD

Horace R. Crawford, 7227 Oakbluff, Dallas, Tex. 75240

Filed Jul. 13, 1979, Ser. No. 57,396
Int. Cl.[3] A61K *33/10, 33/00, 33/02*
U.S. Cl. 424—127 **8 Claims**

1. A method of treating cold sores which comprises orally ingesting an effective amount of a carbonate salt to cure said cold sore and eliminate soreness caused by said cold sore.

4,250,169

METHOD OF PRODUCING ANTIBIOTICS SUPPOSITORIES

Kaoru Hosoi; Tadamasa Ikeda, both of Yokohama; Takemi Nakayoshi, Kawasaki, and Akira Okada, Zushi, all of Japan, assignors to Meiji Seika Kaisha Ltd., Japan

Continuation of Ser. No. 870,524, Jan. 18, 1978, abandoned. This application Jun. 6, 1979, Ser. No. 45,967
Claims priority, application Japan, Jan. 21, 1977, 52-4854
Int. Cl.[3] A61K *31/70, 31/71*
U.S. Cl. 424—181 **1 Claim**

1. A suppository for the therapeutic administration of dibekacin comprising, a mixture of about 10% by weight of dibekacin sulfate with glycerin trifatty acid ester and from 2 to 10% by weight of the surface active agent polyoxyethylene (20) cetyl ether, the remaining percentage by weight being the glycerin trifatty acid ester.

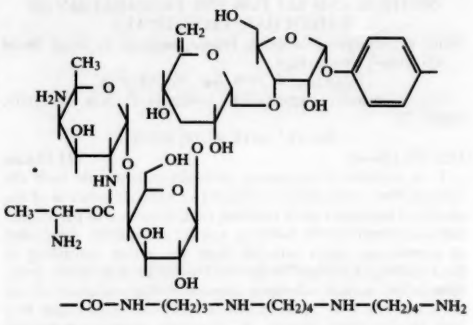
4,250,170

ANTIBACTERIAL AGENTS BU-2349A AND B AND METHOD OF USING SAME

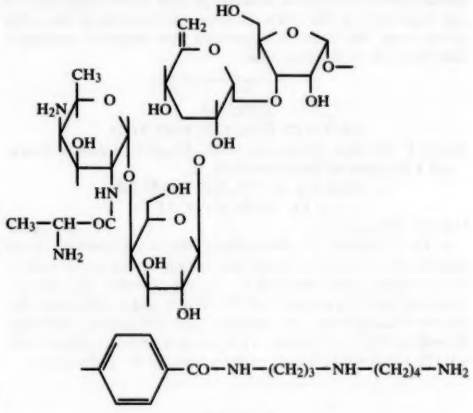
Hiroshi Kawaguchi, Tokyo; Masataka Konishi, Yokohama; Takashi Tsuno, Higashimurayama, and Takeo Miyaki, Yokohama, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 955,035, Oct. 26, 1978, abandoned. This application Jun. 11, 1979, Ser. No. 47,455
Int. Cl.[3] A61K *31/71;* C07H *15/22*
U.S. Cl. 424—181 **9 Claims**

9. A method for inhibiting the growth of pathogenic bacteria in an animal which comprises parenterally administering to said animal an effective antibacterial amount of an antibiotic selected from the group consisting of Bu-2349A having the formula



Bu-2349B having the formula



and a pharmaceutically acceptable acid addition salt of Bu-2349A or B.

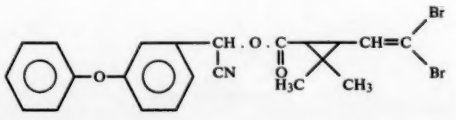
4,250,171

PEST CONTROL

Stuart W. Carter, Berkhamsted, and Peter R. Skidmore, Tring, both of England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 887,934, Mar. 17, 1978, abandoned. This application May 7, 1979, Ser. No. 36,538
Claims priority, application United Kingdom, Mar. 18, 1977, 11504/77
Int. Cl.[3] A01N *37/34, 65/00*
U.S. Cl. 424—189 **9 Claims**

1. A method of controlling the pest *Tribolium castaneum* in stored agricultural produce infected with said pest comprising the application of a pesticidally effective amount of a compound of formula



to the pest or to the infected produce.

4,250,172
NEEDLED FIBER MAT CONTAINING GRANULAR AGENT

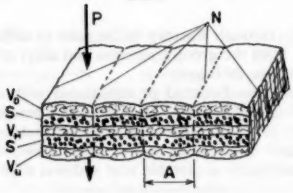
Arnold B. Mutzenberg, Birkenaustrasse 24, CH-9470 Buchs, SG, and Hans P. Hausheer, Im Jörlisbühl, CH-9475 Sevelen, SG, both of Switzerland

Filed Feb. 9, 1979, Ser. No. 10,865

Claims priority, application Switzerland, Feb. 2, 1978, 1685781/78

Int. Cl.³ B32B *5/16*

U.S. Cl. 428—234 **20 Claims**



1. A mat containing a granular agent for treatment of a liquid or gaseous stream flowing through said mat and thereby coming in contact with the granular agent, said mat comprising:

at least two layers of fibrous material;

at least one layer of granular agent located between said layers of fibrous material; and,

wherein said layers of fibrous material are mechanically linked together by needling.

4,250,173
HETEROCYCLIC COMPOUNDS AND PHARMACEUTICAL USE

Barrie C. C. Cantello, Redhill, England, assignor to Beecham Group Limited, England

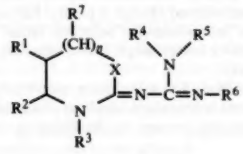
Filed Nov. 14, 1979, Ser. No. 94,100

Claims priority, application United Kingdom, Nov. 29, 1978, 46531/78; May 15, 1979, 15737/79

Int. Cl.³ A61K *31/42, 31/425, 31/535, 31/54;* C07D *263/28, 265/08, 277/18, 279/06*

U.S. Cl. 424—246 **17 Claims**

1. A compound of formula (II) or a pharmaceutically acceptable quaternary ammonium or acid addition salt thereof:



wherein

X represents oxygen or sulphur;

n represents zero or 1;

R^7 represents hydrogen or C_{1-6}alkyl;

R^1 and R^2 are the same or different and represent hydrogen, C_{1-6}alkyl, phenyl, benzyl, or C_{3-6}cycloalkyl;

R^3 represents hydrogen, C_{1-6}alkyl, phenyl or benzyl;

R^4 represents hydrogen or C_{1-6}alkyl;

R^5 represents C_{1-6}alkyl, phenyl optionally substituted with up to 3 groups selected from halogen, C_{1-6}alkyl, and C_{1-6}alkoxy; or benzyl optionally substituted with up to 3 groups selected from halogen, C_{1-6}alkyl and C_{1-6}alkoxy; or R^4 and R^5 together represent the remaining members of a 5- or 6-membered ring optionally containing an oxygen, sulphur or additional nitrogen atom and being optionally substituted with C_{1-6}alkyl, carboxy or C_{1-6}alkoxycarbonyl; and

R^6 represents phenyl, optionally substituted with up to 3 groups selected from halogen, C_{1-6}alkyl, C_{1-6}alkoxy, C_{1-6}alkanoyl, C_{1-6}alkanoyloxy, nitro, hydroxy, amino, substituted amino, carboxy, and C_{1-6}alkoxycarbonyl.

4,250,174
3-SUBSTITUTED IMIDAZO [1,2-A] PYRIDINES

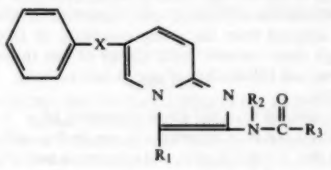
Richard J. Bochis, East Brunswick; Peter Kulsa, Plainfield, and Richard L. Tolman, Warren, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 2, 1979, Ser. No. 35,367

Int. Cl.³ A61K *31/41;* C07D *471/04, 401/02, 403/02*

U.S. Cl. 424—248.5 **5 Claims**

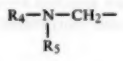
1. A compound having the formula:



wherein

X is sulfur or sulfinyl;

R_1 is, acetyl, haloacetyl, hydroxymethyl, formyl or:



wherein

R_4 is hydrogen or loweralkyl; and

R_5 is hydrogen, loweralkyl, hydroxyloweralkyl, carboxyloweralkyl, aminoloweralkyl, mono- or di- (loweralkyl) aminoloweralkyl, sulfoloweralkyl, or R_4 and R_5 may be joined to form a morpholino or N-methyl piperazino ring;

R_2 is hydrogen or loweralkyl; and

R_3 is loweralkoxy.

4,250,175
METHODS OF TREATING PSYCHOSIS

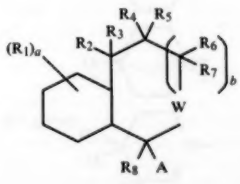
John M. McCall, 3822 Edinburgh, Kalamazoo, Mich. 49007

Division of Ser. No. 847,371, Oct. 31, 1977, Pat. No. 4,179,510. This application Sep. 5, 1979, Ser. No. 72,657

Int. Cl.³ A61K *27/00, 31/38, 31/445, 31/495*

U.S. Cl. 424—248.51 **9 Claims**

1. A method of treating psychosis in humans which comprises administering systemically to humans an antipsychotic dose of a compound selected from the group consisting of compounds having the formula



wherein

R_1 is the same or different and is selected from the group consisting of alkyl of one through three carbons, inclusive, alkoxy of one through three carbons, inclusive, trihaloalkyl of one or two carbons, hydroxy, halo, trihaloalkoxy of one

or two carbons and o-methylenedioxy with the proviso that at least one R_1 is hydroxy, alkoxy or o-methylenedioxy;

a is one through three;

b is zero or one;

R_2 through R_7 are the same or different and are selected from the group consisting of hydrogen, alkyl of one through three carbons, inclusive, hydroxy, alkoxy of one through three carbons; phenyl; halo; cycloalkyl of three through six carbons when R_2 and R_3, R_4 and R_5, or R_6 and R_7 are taken together with the carbon to which they are attached; cycloalkyl of four through seven carbons when R_2 and R_4 or R_4 and R_6 are taken together with the carbons to which they are attached; and cycloalkyl of five or six carbons, with the overall provisos that no more than one ring may be attached to any one carbon and that at least two of R_2 through R_7 are hydrogen;

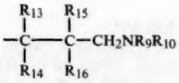
R_a is alkyl of one through three carbons, hydrogen, or phenyl unsubstituted or substituted with a maximum of three substituents selected from the group consisting of alkyl of one through three carbons, halo, alkoxy of one through three carbons, and trihaloalkyl of one to two carbons;

W is sulfur;

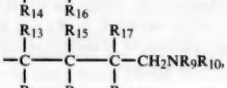
and A is selected from the group consisting of:

(i) $-(CH_2)_nNR_9R_{10}$, wherein n is one to five with the proviso that when b is zero, and n is one or two, R_2 through R_5 cannot all be hydrogen at the same time;

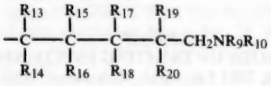
(ii) $-(CH_2)m-(OCH_2CH_2)q-NR_{21}R_{22}$, wherein m and q are each one to three, and R_{21} and R_{22} can be the same or different and are selected from the group consisting of H, alkyl of one through four carbons, and together with the N to which they are attached form heterocyclic rings of four to six ring atoms, morpholine, and NR_9R_{10},



(iii)

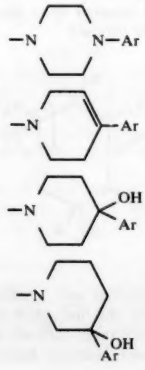


(iv)



(v)

wherein NR_9R_{10} is a heterocyclic amine selected from the group consisting of



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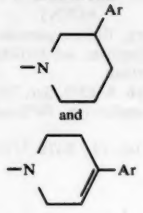


wherein R_{13} through R_{20} may be the same or different and are selected from the group hydrogen and alkyl of from 1 to 2 carbon atoms, inclusive;

Ar is phenyl unsubstituted or substituted with one through three substituents selected from the group consisting of alkyl or alkoxy of one through three carbons, hydroxy, halo, and trihaloalkyl or trihaloalkoxy of one or two carbons and pharmaceutically acceptable acid addition salts thereof.

4,250,176

PIPERAZINE DERIVATIVES

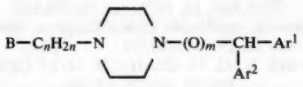
Jan Vandenberk, Beerse; Ludo E. J. Kennis, Vosselaar; Marcel J. M. C. Van der Aa, Vosselaar, and Albert H. M. T. Van Heertum, Vosselaar, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Division of Ser. No. 875,342, Feb. 6, 1978, which is a continuation of Ser. No. 753,062, Dec. 21, 1976, abandoned, which is a continuation-in-part of Ser. No. 672,919, Apr. 2, 1976. This application Jun. 18, 1979, Ser. No. 49,779

Int. Cl.[3] **A61K** *31/495;* **C07D** *403/06, 413/06, 417/06*

U.S. Cl. 424—250 **8 Claims**

1. A chemical compound selected from the group consisting of a compound having the formula



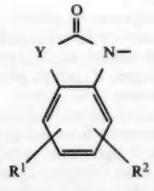
and the pharmaceutically acceptable acid addition salts thereof, wherein:

Ar^1 and Ar^2 are each independently selected from the group consisting of phenyl, substituted phenyl and pyridinyl, wherein said substituted phenyl is phenyl having from 1 to 2 substituents independently selected from the group consisting of halo, lower alkyl, lower alkyloxy, trifluoromethyl and nitro;

n is an integer of from 2 to 6 inclusive, provided that when C_nH_{2n} represents a branched alkylene chain, then at least 2 carbon atoms are present in the linear portion of the chain linking

B with the piperazine nitrogen atom; and

B is: a radical having the formula

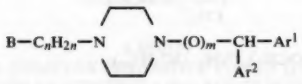


wherein:

R^1 and R^2 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl; and

Y is a member selected from the group consisting of oxygen, sulfur and a substituted nitrogen of the formula >N–L wherein said L is a member selected from the group consisting of hydrogen, lower alkyl, lower alkylcarbonyl, lower alkyloxycarbonyl-lower alkyl, carboxy-lower alkyl, phenyl, phenylmethyl, lower alkylaminocarbonyl, hydroxymethyl, and lower alkenyl.

7. A pharmaceutical composition comprising an inert carrier material and as an active ingredient an effective antihistaminic or anti-anaphylactic amount of a chemical compound selected from the group consisting of a compound having the formula

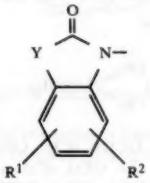


and the pharmaceutically acceptable acid addition salts thereof, wherein:

Ar^1 and Ar^2 are each independently selected from the group consisting of phenyl, substituted phenyl and pyridinyl, wherein said substituted phenyl is phenyl having from 1 to 2 substituents independently selected from the group consisting of halo, lower alkyl, lower alkyloxy, trifluoromethyl and nitro;

n is an integer of from 2 to 6 inclusive, provided that when C_nH_{2n} represents a branched alkylene chain, then at least 2 carbon atoms are present in the linear portion of the chain linking B with the piperazine nitrogen atom; and

B is: a radical having the formula



wherein:

R^1 and R^2 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl; and

Y is a member selected from the group consisting of oxygen, sulfur and a substituted nitrogen of the formula >N—L wherein said L is a member selected from the group consisting of hydrogen, lower alkyl, lower alkylcarbonyl, lower alkyloxycarbonyl-lower alkyl, carboxy-lower alkyl, phenyl, phenylmethyl, lower alkylaminocarbonyl, hydroxymethyl, and lower alkenyl.

4,250,177

SUBSTITUTED 10-OXO-10H-PYRIDAZINO(6,1-b)QUINAZOLINE-2-CARBOXYLIC ACIDS

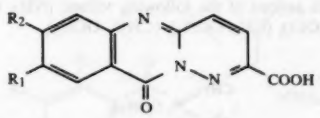
Charles F. Schwender, Dexter, Mich., and Brooks R. Sunday, Hackettstown, N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 968,656, Dec. 11, 1978, abandoned. This application Jan. 21, 1980, Ser. No. 113,849

Int. Cl.³ A61K *31/505;* **C07D** *487/04*

U.S. Cl. 424—250 **7 Claims**

1. A 10-oxo-10H-pyridazino(6,1-b)quinazoline-2-carboxylic acid having the formula



wherein R_1 is hydrogen, halogen; R_2 is hydrogen, lower alkyl containing one to three carbon atoms, or wherein R_1 and R_2 taken together with the carbon atoms to which they are attached is a benzo ring, and the pharmaceutically acceptable salts thereof.

6. A pharmaceutical composition for the treatment of an allergic reaction in which the active ingredient comprises a compound having the formula according to claim 1 or a pharmaceutically acceptable salt thereof together with any of the conventional pharmaceutically acceptable carriers or excipients.

4,250,178

AMIDES DERIVED FROM CARBOXYL-5 PYRIMIDINES

Bernard P. Bucher, Marnes la Coquette; Jean-Francois R. Ancher, Rueil Malmaison, and Thierry F. Imbert, Noisy le Roi, all of France, assignors to Delalande S.A., Courbevoie, France

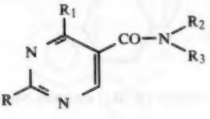
Filed Feb. 12, 1979, Ser. No. 11,752

Claims priority, application France, Feb. 21, 1978, 78 04921; Jan. 30, 1979, 79 02286

Int. Cl.³ A61K *31/505;* **C07D** *239/47, 403/12*

U.S. Cl. 424—251 **12 Claims**

1. Compounds of formula:



(I)

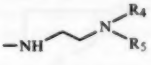
in which the group

represents:

the aziridine group:

in which case the couple (R, R_1) assumes the value (NH_2, OCH_3);

the chain:

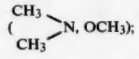


in which the group

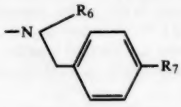
represents:

the tetrahydro 1,2,3,4-isoquinoline-group, in which case the couple (R, R_1) assumes the value (NH_2, OCH_3);

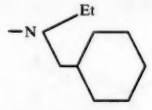
a diethylamino group, in which case the couple (R, R_1) assumes anyone of the following values: (NH_2, OCH_3), (NH_2, OEt), (CH_3, OCH_3), (CH_3S, OCH_3),



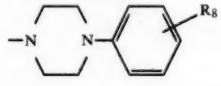
an anilino group, in which case the couple (R, R_1) assumes the value (NH_2, OCH_3);
a benzylamino group



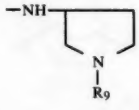
in which the couple (R_6, R_7)
assumes the value (CH_3, H), in which case the couple (R, R_1) assumes the value (NH_2, OCH_3);
assumes the value (Et, H), in which case the couple (R, R_1) assumes anyone of the following values (NH_2, OCH_3), (CH_3, OCH_3), (CH_3, OEt); or
assumes the value (Et, F), in which case the couple (R, R_1) assumes the value (CH_3, OCH_3) or (CH_3, OEt);
an N-ethyl N-cyclohexylmethyl amino group of formula



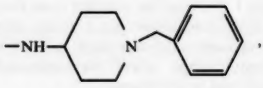
in which case the couple (R, R_1) assumes the value (CH_3, OCH_3); or
an aryl-4 piperazino group of the formula:



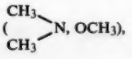
in which R_8 represents:
either a hydrogen atom or a fluorine atom in the para-position, in which cases the couple (R, R_1) assumes the value (CH_3, OCH_3),
or a methoxy group in the ortho position, in which case the couple (R, R_1) assumes the values (NH_2, OCH_3) and (CH_3, OCH_3):
the chain



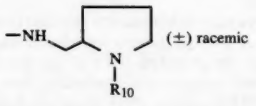
in which R_9 represents:
a cyclohexyl group, in which case the couple (R, R_1) assumes the value (NH_2, OCH_3): or
a benzyl or para fluorobenzyl group, in which cases the couple (R, R_1) assumes the values (NH_2, OCH_3) and (CH_3, OCH_3);
the chain



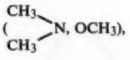
in which case the couple (R, R_1) assumes anyone of the following values: (NH_2, OCH_3), (CH_3, OCH_3), (H, OCH_3), (CH_3O, OCH_3),



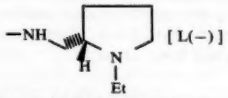
(CH_3NH, OCH_3), (NH_2, OC_3H_{7iso});
the chain



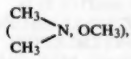
in which R_{10} represents:
a methyl group, in which case the couple (R, R_1) assumes anyone of the following values: (NH_2, OCH_3), (CH_3, OCH_3), (CH_3, OEt), (Et, OEt);
an ethyl group, in which case the couple (R, R_1) assumes anyone of the following values: (NH_2, OCH_3), (NH_2, OEt), (NH_2, OC_3H_{7n}), (NH_2, OC_3H_{7iso}), (CH_3-NH, OCH_3),

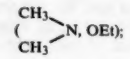


(H, OCH_3), (CH_3, OCH_3), (CH_3, OEt), (CH_3, OC_3H_{7n}), (CH_3, OC_3H_{7iso}), (Et, OEt), (C_3H_{7n}, OCH_3) (C_3H_{7iso}, OCH_3), (CH_3O, OCH_3), (CH_3S, OCH_3);
an n-propyl, n-butyl, benzyl or para-fluorobenzyl group, in which cases the couple (R, R_1) assumes the values: (NH_2, OCH_3) and (CH_3, OCH_3); or
a cylohexylmethyl or allyl group, in which cases the couple (R, R_1) assumes the value (CH_3, OCH_3);
the chain

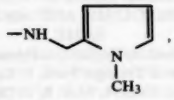


in which case the couple (R, R_1) assumes anyone of the following values: (CH_3, OCH_3), (CH_3, OEt),





or
the chain



in which case the couple (R, R_1) assumes the value (CH_3, OCH_3).

12. A medicinal composition comprising a therapeutically effective amount of a compound as claimed in claim 1 in combination with a pharmacologically acceptable carrier.

4,250,179

METAL COMPLEX IMIDAZOLE FUNGICIDES, AND METHODS OF CONTROLLING FUNGI WITH THEM

Richard J. Birchmore, Hucknall; Robert F. Brookes, Tollerton; Leonard G. Copping, Southwell, and Wilfred H. Wells, Radcliff-on-Trent, all of England, assignors to The Boots Company Limited, Nottingham, England

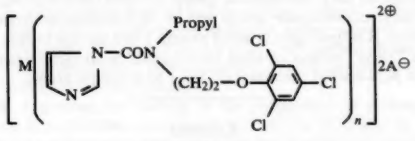
Filed Mar. 27, 1978, Ser. No. 890,765

Claims priority, application United Kingdom, Mar. 26, 1977, 12828/77

Int. Cl.[3] **A01N** *55/02*; **C07F** *1/08, 13/00*

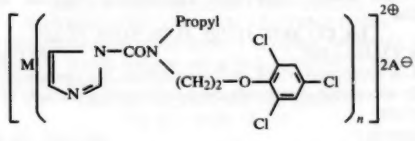
U.S. Cl. 424—245 **11 Claims**

1. A solid fungicidal compound of the formula



in which M is copper or manganese, n is 2 or 4, and A is chloride.

4. A solid fungicidal composition comprising a fungicidally effective amount of a complex compound having the formula:



in which M is copper or manganese, n is 2 or 4, and A is chloride; and a fungicidally acceptable carrier.

9. A method for controlling a phytopathogenic fungus which comprises applying to seeds, plants and their habitat the compound according to claim 1.

4,250,180

METHOD OF TREATING ARRHYTHMIA

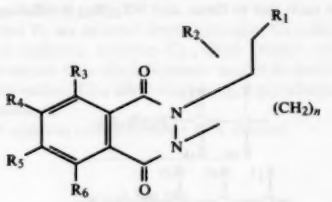
Vinayak V. Kane, Princeton, and Seymour D. Levine, North Brunswick, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Division of Ser. No. 862,718, Dec. 21, 1977, abandoned. This application Jul. 16, 1979, Ser. No. 58,057

Int. Cl.[3] **C07D** *237/30*

U.S. Cl. 424—250 **4 Claims**

1. A method of treating arrhythmia which comprises administering an effective amount of a compound of the formula:



wherein R_1 and R_2 are hydrogen, loweralkyl, phenyl and COOR′ wherein R′ is loweralkyl; R_3, R_4, R_5 and R_6 are hydrogen, loweralkyl, nitro and amino; and n is an integer from 1 to 5, provided that no more than two substituents are on the aromatic ring at any one time.

4,250,181

METHODS OF TREATING PSYCHOSIS

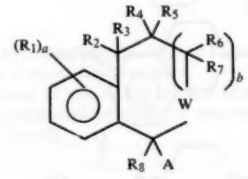
John M. McCall, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 847,371, Oct. 31, 1977, Pat. No. 4,179,510. This application Sep. 5, 1979, Ser. No. 72,659

Int. Cl.[3] **A61K** *31/38, 31/40, 31/445, 31/495*

U.S. Cl. 424—250 **9 Claims**

1. A method of treating psychosis in humans which comprises administering systemically to humans an antipsychotic dose of a compound selected from the group consisting of compounds having the formula



I

wherein

R^1 is the same or different and is selected from the group consisting of alkyl of one through three carbons, inclusive, alkoxy of one through three carbons, inclusive, trihaloalkyl of one or two carbons, hydroxy, halo, trihaloalkoxy of one or two carbons and o-methylenedioxy with the proviso that at least one R_1 is hydroxy, alkoxy or o-methylenedioxy;

a is one through three;

b is zero or one;

R_2 through R_7 are the same or different and are selected from the group consisting of hydrogen, alkyl of one through three carbons, inclusive, hydroxy, alkoxy of one through three carbons; phenyl; halo; cycloalkyl of three through six carbons when R_2 and R_3, R_4 and R_5, or R_6 and R_7 are taken together with the carbon to which they are attached; cycloalkyl of four through seven carbons when R_2 and R_4 or R_4 and R_6 are taken together with the carbons to which they are attached; and cycloalkyl of five or six carbons, with the overall provisos that no more than one ring may be attached to any one carbon and that at least two of R_2 through R_7 are hydrogen;

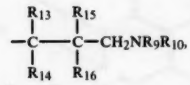
R_8 is alkyl of one through three carbons, hydrogen, or phenyl unsubstituted or substituted with a maximum of three substituents selected from the group consisting of alkyl of one through three carbons, halo, alkoxy of one through three carbons, and trihaloalkyl of one to two carbons;

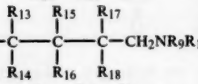
W is sulfur;

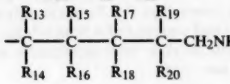
and A is selected from the group consisting of:

(i) $-(CH_2)_nNR_9R_{10}$, wherein n is one to five with the proviso that when b is zero, and n is one or two, R_2 through R_5 cannot all be hydrogen at the same time;

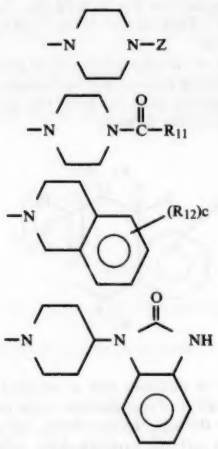
(ii) $-(CH_2)m-(OCH_2CH_2)q-NR_{21}R_{22}$, wherein m and q are each one to three, and $NR_{21}R_{22}$ is NR_9R_{10},


(iii)


(iv)


(v)

wherein NR_9R_{10} is a heterocyclic amine selected from the group consisting of



and

$-NHCH_2CH_2Ar'$

wherein R_{11} is alkyl of one through four carbons, 2-furyl, Ar, alkoxy of one to three carbon atoms, inclusive,

Z is selected from the group consisting of pyridyl, pyrimidinyl, triazinyl, pyrazinyl, pyridazinyl, pyrrolyl, imidazolyl, pyrazolyl, furyl, tetrazyl, oxazolyl, quinoxalinyl, and quinazolinyl, wherein each member of the group can be unsubstituted or substituted with one or two substituents selected from the group consisting of alkyl of one through three carbons, inclusive, alkoxy of one through three carbons, inclusive, hydroxy, halo, and haloalkyl of one through three carbons, inclusive;

R_{12} is alkyl or alkoxy of one through three carbons, hydroxy, halo, or trihalomethyl, R_{13} through R_{20} may be the same or different and are selected from the group hydrogen and alkyl of from 1 to 2 carbon atoms, inclusive;

c is zero through two;

Ar and Ar' are phenyl unsubstituted or substituted with one through three substituents selected from the group consisting of alkyl or alkoxy of one through three carbons, hydroxy, halo, and trihaloalkyl or trihaloalkoxy of one or two carbons and pharmaceutically acceptable acid addition salts thereof.

4,250,182

PHARMACEUTICAL COMPOSITION CONTAINING ACRIDONE COMPOUNDS AND METHOD OF USING SAME

John H. Gorvin, London, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

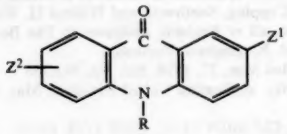
Division of Ser. No. 338,578, Mar. 6, 1973, Pat. No. 3,950,342, which is a continuation-in-part of Ser. No. 287,043, Jul. 9, 1972, abandoned. This application Dec. 22, 1975, Ser. No. 643,603

Claims priority, application United Kingdom, Feb. 24, 1972, 8609/72; Feb. 24, 1972, 8610/72; Aug. 29, 1972, 39940/72; Aug. 29, 1972, 40079/72; Nov. 8, 1972, 41852/72

Int. Cl.³ A61K *31/435, 9/14*

U.S. Cl. 424—257 **8 Claims**

1. A method of preventing the symptoms of asthma or allergic rhinitis in a mammal known to be susceptible to asthma or allergic rhinitis, which comprises administration to said mammal of a prophylactically effective non-toxic dose of a compound of formula (1)


(I)

wherein in formula I Z^1 and Z^2 are each selected from a carboxyl group, a pharmaceutically acceptable carboxylate salt group, an alkyl carboxylate group, a carboxamide group, an N-alkyl carboxamide group and an N,N-dialkylcarboxamide group; R is hydrogen or alkyl having 1 to 4 carbon atoms; and the "alkyl" moiety of alkyl carboxylate, N-alkylcarboxamide and N,N-dialkyl carboxamide has 1 to 6 carbon atoms.

4,250,183

N-(SUBSTITUTED AMINO)ALKANOYL-AMINOALKANOIC ACIDS AND SALTS, THEIR USE AND THEIR COMPOSITIONS

Walter Krastinat, Constance, Fed. Rep. of Germany, assignor to BYK Gulden Lomberg Chemische Fabrik GmbH, Constance, Fed. Rep. of Germany

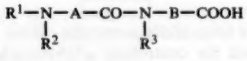
Filed Dec. 15, 1978, Ser. No. 969,702

Claims priority, application Luxembourg, Dec. 30, 1977, 78804

Int. Cl.³ A61K *31/195, 31/20, 31/34, 31/38*

U.S. Cl. 424—263 **53 Claims**

1. A compound which, in free-acid form, is a pharmacologically-acceptable ω-aminoalkanoyl-ω-aminoalkanoic acid of the formula



wherein R^1 is a member selected from the group consisting of hydrocarbyl-aliphatic carbonyl having from 2 to 8 carbon atoms, hydrocarbyl-alicyclic carbonyl from 3 to 10 ring carbon atoms, optionally-substituted benzoyl, 2-furoyl, 3-furoyl, 2-thenoyl, 3-thenoyl, nicotinoyl, isonicotinoyl, picolinoyl, 2-pyrrolecarbonyl and 3-pyrrolecarbonyl;

R^2 is—H, cycloalkyl with from 5 to 8 ring carbon atoms, 1-(hydrocarbyl-aliphatic with up to 5 carbon atoms)-substituted cycloalkyl with from 5 to 8 ring carbon atoms, adamantyl, phenyl, substituted phenyl, substituted lower alkyl, branched-chain lower alkyl or (when R^3 is other than straight-chain lower alkyl) straight-chain lower alkyl;

R^3 is substituted lower alkyl, branched-chain lower alkyl, straight-chain lower alkyl, phenyl, substituted phenyl, cycloalkyl with from 5 to 8 ring carbon atoms, 1-(hydro-

carbyl-aliphatic with up to 5 carbon atoms)-substituted cycloalkyl with from 5 to 8 ring carbon atoms, adamantyl, or (when R^2 is other than —H) —H, or (jointly with R^5) trimethylene;

R^4 is methyl, benzyl, hydroxymethyl, 2-hydroxyethyl, methylmercaptomethyl or 2-methylmercaptoethyl;

R^5 is, independently, one of the meanings ascribed to R^4 or, together with R^3, trimethylene;

A is $—(CH_2)_m—$ or $—CH(R^4)—$;

B is $—(CH_2)_n—$ or $—CH(R^5)—$; and

each of m and n is, independently, a positive whole number of at most 5;

each substituted lower alkyl is a radical of the formula

$$—C(R^9)(R^{10})(R^{11});$$

each R^9 is, independently, —H, alkyl with from 1 to 5 carbon atoms, alkenyl with from 2 to 5 carbon atoms or alkynyl with from 2 to 5 carbon atoms;

each R^{10} is, independently, —H, alkyl with from 1 to 5 carbon atoms, cycloalkyl with from 3 to 8 ring carbon atoms or optionally-substituted phenyl;

each R^{11} is, independently, alkyl with from 1 to 5 carbon atoms, cycloalkyl with from 3 to 8 ring carbon atoms, cycloalkylalkyl with from 3 to 8 ring carbon atoms and from 1 to 3 carbon atoms in the alkyl, optionally-substituted phenyl or (optionally-substituted phenyl)-alkyl with from 1 to 3 carbon atoms in the alkyl; and

any substituent of substituted phenyl or of substituted benzoyl is a member selected from the group consisting of halo, alkyl, having up to 8 carbon atoms, hydroxy, alkoxy having up to 8 carbon atoms, alkylmercapto having up to 8 carbon atoms, carboxylic acid acyloxy, organic carbonic acid acyloxy, optionally-substituted amino wherein any substituent is alkanoyl having from 2 to 5 carbon atoms or lower alkyl, nitro, trifluoromethyl, trifluoromethoxy and trifluoromethylmercapto.

48. A process for treating or for prophylaxis of a disease which is attributable to stomach or intestine disorders or to reduced performance of the pancreas, gall bladder and/or liver which comprises administering to a mammal afflicted with or subject to such disorder an effective amount of a pharmacologically-acceptable compound according to claim **1**.

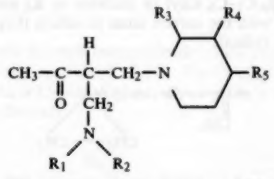
4,250,184

TREATMENT OF PAIN, FEVER, AND INFLAMMATION WITH COMPOSITIONS CONTAINING PIPERIDINOBUTAN-AND 3-BUTEN-2-ONES

Nathaniel Grier, Englewood; Richard A. Dybas, Somerville, and Bruce E. Witzel, Rahway, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 20, 1979, Ser. No. 59,404
Int. Cl.³ A61K *31/445*
U.S. Cl. 424—267 **10 Claims**

1. A method of treating a condition exhibiting at least one of the symptoms of pain, fever, and inflammation, comprising administering to a patient in need of such treatment a therapeutically effective amount of a compound of the formula:



wherein

R_1 and R_2 are independently selected from hydrogen; C_{1-8} alkyl; C_{2-8} alkenyl; hydroxy C_{1-8} alkyl; and cyclo C_4 alkyl; or R_1 and R_2 taken together with the nitrogen atom form a five- or six-membered saturated heterocyclic ring substituted at the 2-, 3-, and 4-position with R_3, R_4, and R_5, respectively; and

R_3, R_4, and R_5 are selected from hydrogen; C_{1-3} alkyl; C_{2-3} alkenyl; hydroxy; hydroxy C_{1-3} alkyl; phenyl; carboxyl; carboxamido; C_{1-4} alkyl N-mono- and N,N-disubstituted carbonylamino; C_{1-4} alkoxycarbonyl; 1-pyrrolidinyl; and 1-piperidinyl;

and acid addition and quaternary salts thereof.

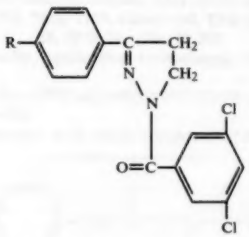
4,250,185

1-(3,5-DICHLOROBENZOYL)-3-PHENYLPYRAZOLINES AND THEIR USE AS MILDEWICIDES

Edmund J. Gaughan, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

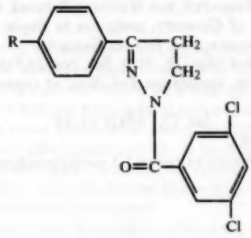
Filed Mar. 10, 1980, Ser. No. 128,687
Int. Cl.³ A01N *43/56*; C07D *231/06*
U.S. Cl. 424—273 P **8 Claims**

1. A compound having the formula



where R is hydrogen, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms or halo.

7. A method of controlling mildew comprising applying thereto a moldewicidally effective amount of a compound having the formula



where R is hydrogen, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms or halo.

4,250,186

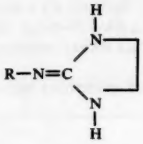
METHOD OF SLOWING HEART RATE

Helmut Stähle; Herbert Köppe; Werner Kummer, all of Ingelheim am Rhein; Wolfgang Hoefke, Budenheim; Wolfram Gaida, Ingelheim am Rhein, all of Fed. Rep. of Germany, and Ludwig Pichler, Vienna, Austria, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Filed Feb. 16, 1979, Ser. No. 12,650
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1978, 2806775
Int. Cl.³ A61K *31/415*
U.S. Cl. 424—273 R **1 Claim**

1. The method of slowing the heart rate of a warm-blooded animal in need thereof, which comprises enterally or parenter-

ally administering to said animal an effective bradycardiac amount of a compound of the formula



wherein

R is 2-bromo-4,5-dihydroxy-phenyl; 3-chloro-4-hydroxy-phenyl; 4-bromo-2,5-dihydroxy-phenyl; 3,5-dihydroxy-phenyl; 5-chloro-2,4-dihyroxyphenyl; 3-hydroxy-4-methyl-phenyl; 2,6-dibromo-4-hydroxy-methyl-phenyl; 3,5-dibromo-4-amino-phenyl; 3-methyl-mercapto-phenyl; 3,4,5-trihydroxy-phenyl; or 3-bromo-4-fluoro-phenyl;

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

4,250,187

4,5-DICHLORO-3-ORGANO-1,2-METHYLENEDIOXY-BENZENE ARTHROPODICIDE SYNERGIZING AGENTS

Volker Mues, Wuppertal, and Wolfgang Behrenz, Overath, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

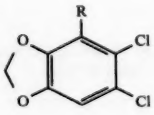
Filed Mar. 28, 1979, Ser. No. 24,745

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1978, 2816474

Int. Cl.[3] **A01N** *43/16*

U.S. Cl. 424—282 **18 Claims**

1. A 4,5-dichloro-3-organo-1,2-methylenedioxybenzene of the formula



in which

R is alkyl, alkenyl, aralkyl, aryl, O-alkyl, O-alkenyl, O-aralkyl or O-aryl.

8. An arthropodicidal composition containing as active ingredients (1) at least one compound according to claim **1** and (2) an arthropodicidally effective amount of at least one compound selected from the group consisting of (A) carbamates, (B) carboxylic acid esters, (C) phosphoric acid esters and (D) halogenoalkanes.

10. A method of combating arthropods which comprises applying to the arthropods, or to a habitat thereof, an arthropodicidally effective amount of a composition according to claim **8**.

4,250,188

CERTAIN PGI$_1$ COMPOUNDS AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Carmelo Gandolfi, Milan; Carlo Passarotti, Gallarate; Alessandro Andreoni, Cologna Monzese; Angelo Fumagalli, Monza; Franco Faustini, Milan; Roberto Ceserani, Milan, and Maria M. Usardi, Milan, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

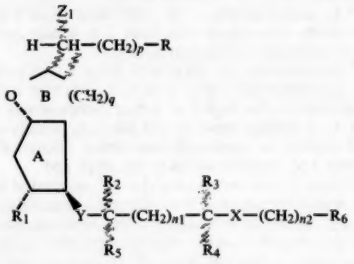
Division of Ser. No. 15,148, Feb. 26, 1979, which is a continuation of Ser. No. 859,703, Dec. 12, 1977. This application Nov. 1, 1979, Ser. No. 90,305

Claims priority, application Italy, Dec. 31, 1976, 31041 A/76; Jan. 14, 1977, 19283 A/77; Mar. 14, 1977, 21171 A/77; Mar. 21, 1977, 21412 A/77; Mar. 31, 1977, 21863 A/77

Int. Cl.[3] **C07D** *307/935;* **A61K** *31/34*

U.S. Cl. 424—285 **15 Claims**

1. A compound of the formula



(I)

wherein

R is a free carboxy group or an esterified carboxy group of the formula —COOR$_c$, wherein R$_c$ is C$_1$–C$_{12}$ alkyl or C$_2$–C$_{12}$ alkenyl;

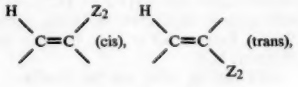
Z$_1$ is hydrogen or halogen;

p is zero or an integer of 1 to 7;

q is 1;

R$_1$ is C$_1$–C$_6$ alkoxy, ar-C$_1$–C$_6$ alkoxy, wherein the aryl groups are selected from the group consisting of phenyl, α-naphthyl or β-naphthyl, C$_2$–C$_{12}$ alkanoyloxy or benzoyloxy;

Y is a member selected from the group consisting of —CH$_2$—CH$_2$—,

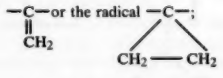


wherein Z$_2$ is hydrogen;

one of R$_2$ and R$_5$ is C$_2$–C$_6$ alkenyl, C$_2$–C$_6$ alkynyl or aryl and the other is hydroxy, C$_1$–C$_6$ alkoxy, ar-C$_1$–C$_6$ alkoxy,

wherein the aryl groups are selected from the group consisting of phenyl, α-naphthyl or β-naphthyl;

each of R$_3$ and R$_4$, which are the same or different, may be hydrogen, C$_1$–C$_6$ alkyl or fluorine or R$_3$ and R$_4$, taken together with the carbon atom to which they are linked, form the radical



each of n$_1$ and n$_2$, which are the same or different, is zero or an integer of 1 to 6;

X is —(CH$_2$)$_m$— wherein m is zero or 1;

R$_6$ is a member selected from the group consisting of

(a′) hydrogen;

(b′) C$_1$–C$_4$ alkyl;

and the pharmaceutically or veterinarily acceptable salts thereof.

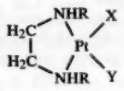
6. A hypotensive composition comprising a pharmaceutically effective amount of a compound as claimed in any one of claims 5 or 1–4, and a pharmaceutically or veterinarily acceptable carrier and/or diluent.

4,250,189
COMPOSITIONS CONTAINING PLATINUM

Paul D. Hydes, and David M. Watkins, both of Reading, England, assignors to Johnson, Matthey & Co., Limited, London, England

Filed Apr. 18, 1979, Ser. No. 31,876
Claims priority, application United Kingdom, Apr. 20, 1978, 15660/78; May 26, 1978, 22968/78
Int. Cl.³ A01N *55/02;* A61K *31/28*
U.S. Cl. 424—287 **3 Claims**

1. A coordination complex of platinum having the formula:



in which the R groups are the same or different and are selected from H and lower alkyl and X and Y are the same or different ligands selected from sulphate, phosphate, nitrate, acetate, chloroacetate and water, provided that X and Y are not both water, such that the platinum is present as Pt(II).

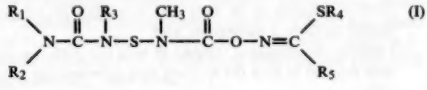
2. A pharmaceutical composition comprising an effective amount of a compound according to claim 1 in combination with a pharmaceutically acceptable carrier.

4,250,190
(O-(N-METHYLCARBAMOYL)-OXIME)-(N,N,N-TRIALKYLUREA)-N,N-SULFIDE DERIVATIVES, PROCESSES FOR PRODUCING THEM, COMPOSITIONS CONTAINING THESE DERIVATIVES AS ACTIVE INGREDIENTS, AND THE USE THEREOF FOR CONTROLLING INSECT PESTS

Jozef Drabek, Oberwil, Switzerland, and Manfred Böger, Weil am Rhine, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

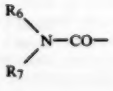
Filed Aug. 30, 1979, Ser. No. 68,300
Claims priority, application Switzerland, Aug. 31, 1978, 9198/78; Mar. 13, 1979, 2377/79; Jun. 11, 1979, 5433/79
Int. Cl.³ A01N *37/18;* C07C *69/708*
U.S. Cl. 424—298 **9 Claims**

1. A compound of the formula I



(I)

wherein R_1 and R_2 each independently of the other is C_1–C_4-alkyl or C_3–C_6-cycloalkyl, R_3 is C_1–C_8-alkyl or C_3–C_6-cycloalkyl, R_4 is C_1–C_3-alkyl or allyl and R_5 is methyl or a group of the formula



wherein R_6 and R_7 each independently of the other is hydrogen or methyl.

4,250,191
PREVENTING RENAL FAILURE

K. David G. Edwards, 427 Washington St., New York, N.Y. 10013

Filed Nov. 30, 1978, Ser. No. 965,059
Int. Cl.³ A61K *31/19, 31/195, 31/235, 31/455*
U.S. Cl. 424—308 **6 Claims**

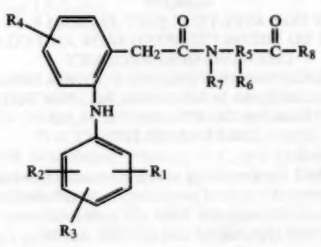
1. A method of treating renal failure or damage in a host in need of said treatment comprising administering to said host an effective amount for treating renal failure or damage of at least one antihyperlipidemic substance comprising a phenoxyacetic acid derivative which lowers lipid levels in the blood stream of the host.

4,250,192
NOVEL SUBSTITUTED PHENYLACETIC ACID AMIDE COMPOUNDS

Alfred Sallmann, Bottmingen, and Gerhard Baschang, Bettingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 905,087, May, 1978, abandoned, and Ser. No. 906,292, May, 1978, abandoned. This application Apr. 25, 1979, Ser. No. 33,295
Claims priority, application Luxembourg, May 11, 1977, 77316
Int. Cl.³ C07C *101/447;* A01N *37/10, 37/12*
U.S. Cl. 424—309 **9 Claims**

1. A phenylacetic acid amide compound of the formula



(I)

in which each of R_1 and R_2 is hydrogen, lower alkyl, lower alkoxy, halogen having an atomic number of not more than 35 or trifluoromethyl, each of R_3 and R_4 is hydrogen, lower alkyl, lower alkoxy or halogen having an atomic number of not more than 35, R_5 is lower alkylene or lower alkylidene, R_6 is carboxyl or lower alkoxycarbonyl, R_7 is hydrogen and R_8 is hydroxy or lower alkoxy, wherein the radical of the formula $—NR_7—\ R_5(R_6)—CO—R_8$ has the D-configuration, or a therapeutically acceptable salt thereof.

9. A pharmaceutical preparation containing an anti-inflammatory effective amount of a compound as claimed in claim 1 together with conventional pharmaceutical excipients.

4,250,193
COSMETICS

Michio Ochiai, Yokohama; Noriaki Tonooka, and Kenkichi Matubara, both of Yokosuka, all of Japan, assignors to Pola Chemical Industries, Inc., Shizuoka, Japan

Filed Jul. 5, 1978, Ser. No. 922,112
Claims priority, application Japan, Jul. 5, 1977, 52/79541
Int. Cl.³ A61K *7/48*
U.S. Cl. 424—358 **4 Claims**

1. A cosmetic product for appalicatioan to the skin, and hair capable of endowing the skin and hair with wettability and softening action which comprises about 35–70% water, about 15–50% alcohol and about 5–20% of an oily bisdiglyceryl ether compound selected from the group consisting of bis-(propylglyceryl)-triethylene ether, bis-(propylglyceryl)-tetraethylene ether, bis-(butylglyceryl)-tetraethylene ether, bis-

(butylglyceryl)-pentaetylene ether, bis-(butylglyceryl)-triethylene glycol ether, bis-(ethylglyceryl)-diethylene glycol ether, bis-(methylglyceryl)-dipentalene glycol ether, bis-(butylglyceryl)-diethylene glycol ether, bis-(amylglyceryl)-tetraethylene glycol ether and bis-(propylglyceryl)-dibutylene glycol ether, the compound being easily dissolved and remaining stable in the water-alcohol system.

4,250,194

FLAVORING WITH GERANYL BUTYL ETHER

Cynthia J. Mussinan, Bricktown; Braja D. Mookherjee, Holmdel; Manfred H. Vock, Locust; Frederick L. Schmitt, Holmdel, all of N.J.; Edward J. Shuster, Brooklyn, N.Y.; James M. Sanders, Eatontown, N.J.; Bette M. Light, Highlands, N.J., and Edward J. Granda, Englishtown, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 012,798, Feb. 16, 1979, which is a division of Ser. No. 939,897, Sep. 5, 1978, Pat. No. 4,163,068, which is a division of Ser. No. 872,937, Jan. 27, 1978, Pat. No. 4,131,687.

This application Oct. 26, 1979, Ser. No. 88,615

Int. Cl.[3] A23L *1/226*

U.S. Cl. 426—3 **1 Claim**

1. A process for imparting citrus, floral and rosey aroma characteristics and citrus, nutty, floral, rosey and bitter flavor characteristics to a foodstuff or chewing gum comprising the step of adding to said material from 0.5 ppm up to about 100 ppm or geranyl butyl ether.

4,250,195

METHOD FOR APPLYING SOFT FLEXIBLE SUGAR COATING TO FRESH CHEWING GUM AND COATED CHEWING GUM PRODUCT

Subraman R. Cherukuri, and Dominick R. Friello, both of Danbury, Conn., assignors to Life Savers, Inc., New York, N.Y.

Filed Sep. 24, 1979, Ser. No. 78,115

Int. Cl.[3] A23G *3/30*

U.S. Cl. 426—5 **10 Claims**

1. A method for preparing a sugar coated chewing gum, which comprises the steps of preparing fresh soft chewing gum center portions, allowing the fresh soft center portions to age for 1 to 3 hours, applying to said still soft and fresh chewing gum center portions a first coating syrup consisting essentially of an aqueous solution of a sugar material, corn syrup , a binder and optionally a film-forming agent, and applying to said so-treated center portions a coating dusting mix consisting essentially of a sugar material in dry form, at least a portion of said dry sugar material being absorbed on the first coating syrup applied to said center portions to form a continuous soft flexible coating which tightly adheres to said center portions, and further including the step of applying a second coating syrup to said center portions previously coated with said first coating syrup and said coating dusting mix, said second coating syrup consisting essentially of an aqueous solution of a sugar, and optionally corn syrup, and serving to smooth out and providing a shine to the coating of said sugar material previously applied to said center portions.

4,250,196

CENTER-FILLED CHEWING GUMS

Dominick R. Friello, Danbury, Conn., assignor to Life Savers, Inc., New York, N.Y.

Filed Oct. 9, 1979, Ser. No. 83,088

Int. Cl.[3] A23G *3/30*

U.S. Cl. 426—5 **24 Claims**

1. A center-filled chewing gum having improved softness retention, flexibility, and excellent shelf-life comprising a chewing gum piece including an enclosed cavity therein, and a liquid fill in said cavity, said liquid fill including an aqueous solution consisting essentially of hydrogenated starch hydrolysate as a sweetener and humectant, said hydrogenated starch hydrolysate being present as a solid in the liquid fill in an amount of from about 75 to about 93% by weight of the liquid fill.

4,250,197

METHOD FOR PROCESSING PLANT PROTEIN

Lehel Koch, Budapest, Hungary, assignor to Vepex Fövállalkopási Iroda Rt., Tatabánya, Hungary

Continuation of Ser. No. 790,248, Apr. 25, 1977, abandoned. This application Mar. 13, 1978, Ser. No. 885,631

Claims priority, application Hungary, Oct. 25, 1976, LI 300

Int. Cl.[3] A23J *3/00*

U.S. Cl. 426—51 **10 Claims**

1. A process for the separation and purification of plant proteins from the pressed juice of green plants comprising

(a) coagulating a chloroplastic protein fraction in form of a green sludge from said juice at a temperature below 50° C. in the presence of an inorganic flocculating agent;

(b) separating said green sludge from a remaining juice and subjecting the sludge in an aqueous suspension to a protease enzyme until about 5% by weight of the protein components are degraded;

(c) extracting said sludge after enzymatic treatment with at least one polar solvent such that the water to solvent ratio is at least 80:20 to remove pigments and lipids from protein;

(d) isolating an extracted pigment and a lipid concentrate by distilling off the solvent and drying the residue, and

(e) isolating a cytoplasmic protein fraction by coagulating the remaining juice from step (b) at a temperature of about 80° C., separating and drying the protein precipitate.

4,250,198

MEAT SNACK ANALOG

Donald B. Millar, Cobourg; Edward D. Murray, Winnipeg, and Terrence J. Maurice, Colborne, all of Canada, assignors to General Foods, Limited, Toronto, Canada

Filed Jun. 25, 1979, Ser. No. 51,787

Int. Cl.[3] A23J *3/00;* **A23D** *5/00*

U.S. Cl. 426—335 **18 Claims**

1. In a method for the formation of a proteinaceous snack product by stuffing a substantially uniform mix of protein, lipid material, water, spices, seasonings and flavourings into a suitable casing, drying the stuffed material to a desired moisture content sufficiently low to inhibit microbial growth at ambient temperature, and packaging the dried product in discrete lengths in moisture-proof packages, the improvement which consists essentially of forming protein, lipid material and water into said substantially uniform mix by the steps of:

(a) emulsifying at least one food grade lipid material in water using at least one proteinaceous non-meat food emulsifier to form an emulsion,

(b) dispersing non-meat protein fibres constituting the sole proteinaceous texturing agent in an aqueous dispersion and/or solution of at least one non-meat proteinaceous binder to form a dispersion, and

(c) mixing the emulsion formed in step (a) with the dispersion formed in step (b) to form said substantially uniform mix,

the ingredients being used in proportions sufficient to provide a snack food product having the composition:

Non-meat proteins	
- texturing protein	about 10 to about 70% by wt.
- binding and emulsifying protein	about 5 to about 65% by wt.
Water	about 5 to about 35% by wt.
Lipid material	about 10 to about 60% by wt.
Suitable spices, colouring agents and flavourings	up to about 15% by wt.

4,250,199

SMOKE FLAVORED HYDROPHILIC LIQUID CONCENTRATE AND PROCESS OF PRODUCING SAME

Gary L. Underwood, Whitelaw, and William L. Wendorff, Manitowoc, both of Wis., assignors to Red Arrow Products Company, Milwaukee, Wis.

Filed Jun. 28, 1979, Ser. No. 52,835
Int. Cl.[3] A23L *1/232, 1/31*
U.S. Cl. 426—533 25 Claims

1. A smoke flavor concentrate soluble in brine comprising a hydrophilic liquid selected from the group consisting of glycols, polyglycerol esters, polyethylene glycol esters and polyoxyethylene sorbitan esters, containing smoke flavor phenolic materials which have been extracted from an edible smoke flavored oil, said concentrate containing a minimum of 2 mg/g of phenolic materials and less than one percent by weight of titratable acidity per each 10 mg/g of phenol content.

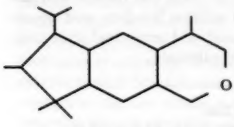
4,250,200

FLAVORING WITH A MIXTURE OF ISOCHROMAN MUSK COMPOUNDS

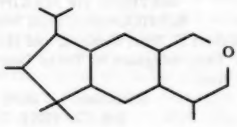
Wilhelmus J. Wiegers, Red Bank; Mark A. Sprecker, Sea Bright; Hugh Watkins, Lincroft; Manfred H. Vock, Locust, and Frederick L. Schmitt, Holmdel, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Aug. 3, 1979, Ser. No. 63,374
Int. Cl.[3] A23L *1/226, 1/235*
U.S. Cl. 426—536 2 Claims

1. A process for augmenting or enhancing the pear aroma or taste of a pear flavored foodstuff comprising the step of adding to said foodstuff from 0.0001 parts per million up to about 50 parts per million by weight, based on the weight of said foodstuff, of a mixture of compounds having the structures:



and



4,250,201

USE OF MIXTURE CONTAINING CARYOPHYLLENE ALCOHOLS FOR AUGMENTING OR ENHANCING THE AROMA OR TASTE OF FOODSTUFFS

Cynthia J. Mussinan, Bricktown; Braja D. Mookherjee, Holmdel; Manfred H. Vock, Locust; Joaquin F. Vinals, Red Bank, all of N.J.; Jacob Kiwala, Brooklyn, N.Y., and Frederick L. Schmitt, Holmdel, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 947,186, Sep. 29, 1978. This application Dec. 21, 1979, Ser. No. 106,155
Int. Cl.[3] A23L *1/226*
U.S. Cl. 426—538 1 Claim

1. A process for augmenting or enhancing the aroma or taste of a foodstuff comprising the step of intimately admixing with a foodstuff from about 0.5 ppm up to about 500 ppm based on the total weight of said foodstuff of a product produced by a process comprising the step of (i) intimately admixing aluminum isopropylate, toluene and caryophyllene oxide to form a mixture; (ii) heating the resulting mixture at a temperature of from 100° C. up to 150° C. for a period of time of from about 1 up to about 5 hours; and (iii) recovering the rearranged caryophyllene oxide, a mixture consisting essentially of alcohols, from the reaction mass by fractional distillation of said reaction mass, at a vapor temperature of from 140° C. up to 142° C.; a liquid temperature of 155° C. and a vacuum of 2.8 up to 3.5 mm/Hg pressure; the concentration of aluminum isopropylate catalyst in the reaction mass varying from about 0.025 molar up to about 0.75. molar; and the concentration of caryophyllene oxide in the reaction mass varying from about 0.25 molar up to about 1.00 molar.

4,250,202

CAKE COMPOSITIONS CONTAINING HIGH FRUCTOSE CORN SYRUP

Deborah I. Hartnett, West Chester, Pa., assignor to ICI Americas Inc., Wilmington, Del.

Filed Sep. 1, 1978, Ser. No. 938,824
Int. Cl.[3] A21D *10/04*
U.S. Cl. 426—553 4 Claims

1. A cake batter comprising flour, sweetener, a chemical leavening agent and shortening wherein said sweetener is 100–200% by weight based on the weight of the flour and consists of a blend a high fructose corn syrup and corn syrup, said blend having the ratio of 40/60–60/40 parts by weight, respectively of said high fructose corn syrup and corn syrup and said chemical leavening agent is a non-nucleating single-stage leavening system, said batter further comprising from 0.2–3.7% based on the weight of the flour of an emulsifier blend consisting of mono and diglycerides of fat forming fatty acids and ethoxylated sorbitan monostearate; the weight ratio of the mono and diglycerides to the ethyloxated sorbitan derivative being 1.5/1–4/1.

4,250,203

CATIONICALLY POLYMERIZABLE COMPOSITIONS CONTAINING SULFONIUM SALT PHOTOINITIATORS AND ODOR SUPPRESSANTS AND METHOD OF POLYMERIZATION USING SAME

Sheldon I. Schlesinger, Windsor, N.J., and Dennis E. Kester, Newtown, Conn., assignors to American Can Company, Greenwich, Conn.

Filed Aug. 30, 1979, Ser. No. 71,283
Int. Cl.[3] B05D *3/06;* C08F *2/46, 8/00*
U.S. Cl. 427—44 18 Claims

12. In a method of cationic polymerization, the steps comprising:

A. admixing 50–99 parts by weight of a cationically polymerizable material as essentially the sole polymerizable material, at least 0.1 part by weight of a sulfonium salt photoinitiator which decomposes upon exposure to electromagnetic radiation to provide a Lewis acid to initiate polymerization of said cationically polymerizable material, said sulfonium salt photoinitiator upon decomposition generating an odorous organic sulfur compound; 0.1–15 percent by weight of an organic sulfur compound scavenger operable to react with the organic sulfur compound released upon photodecomposition of said sulfonium salt photoinitiator to reduce the sulfur odor generated thereby, said scavenger being activated upon exposure to the electromagnetic radiation and being selected from the group consisting of organic ketones, benzoin compounds, aryloin oxime compounds, organic peroxide compounds, and benzil compounds and, as optional additives, vinyl chloride, fillers, diluents, dyes, pigments and processing aids to form a cationically photopolymerizable composition consisting essentially of said cationically polymerizable material, sulfonium salt photoinitiator, organic sulfur compound scavenger and processing aids; and

B. exposing said composition to electromagnetic radiation to decompose said sulfonium salt photoinitiator to generate a Lewis acid to initiate polymerization of said polymerizable material and to activate said scavenger to react with organic sulfur compounds generated by decomposition of said sulfonium salt photoinitiator, said polymerization

being characterized by substantial freedom from malodorous sulfur compounds.

13. The method of claim 12 wherein said photopolymerizable composition is applied to a substrate as a coating prior to said step of exposure to electromagnetic radiation.

4,250,204

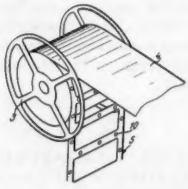
METHOD FOR IMPREGNATION OF CERMET ELECTRODES OF AN ALKALINE STORAGE BATTERY

Ivan A. Kolosov, ulitsa Astrakhanskaya, 118, kv. 54; Nikolai V. Kuryshev, ulitsa Ordzhonikidze, 6, kv. 11; Jury E. Ivanyatov, ulitsa M. Zatonskaya, 21; Vera N. Kalininskaya, ulitsa Sakko-Vantsetti, 23, kv. 23, all of Saratov; Igor K. Yartsev, Grazhdansky prospekt, 94, korpus 2, kv. 8, Leningrad; Arkady K. Pugachev, Pravy Bereg Nevy, 222, korpus 3, kv. 85, Leningrad, and Svetlana M. Savina, Poljustrovsky prospekt, 5, kv. 179, Leningrad, all of U.S.S.R.

Division of Ser. No. 778,951, Mar. 18, 1977, Pat. No. 4,171,679. This application Nov. 13, 1978, Ser. No. 959,423

Int. Cl.³ B05D *5/12*

U.S. Cl. 427—58 **6 Claims**



1. A method of impregnation of cermet electrodes of an alkaline storage battery, comprising prior to impregnating said electrodes, reeling onto a reel form a sintered band stock, together with a spacer element arranged over the entire length and width of said band stock so as to provide an appropriate space between the turns of said band stock and placing the reeled band stock with said spacer element into active solutions, said spacer element being made of fluorine-containing materials having high chemical, thermal and mechanical resistance, and being formed of a plurality of separate apertured frames, each having projections on both sides thereof and a large central cutout, and said frames being interconnected by hinge joints forming a continuous chain of frames of a predetermined length, whereby a frame may be replaced if one breaks during use, and whereby exceptionally thin band stock can be impregnated.

4,250,205

PROCESS FOR DEPOSITING A III–V SEMI-CONDUCTOR LAYER ON A SUBSTRATE

Georges Constant, Ramonville Saint Agne; Raymond Haran, Grenade; Albert Lebugle, Toulouse; Aref Zaouk, Toulouse; Roland Morancho, Toulouse, and Philippe Pouvreau, Maillezais, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Filed Sep. 12, 1978, Ser. No. 941,728

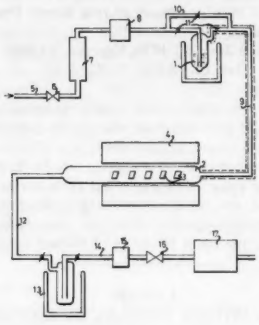
Claims priority, application France, Sep. 16, 1977, 77 28237

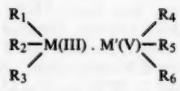
Int. Cl.³ H01L *21/205, 21/20*

U.S. Cl. 427—87 **28 Claims**

1. A process for depositing a layer of a semi-conductor composition, said layer comprising elements M(III) and M'(V) selected from group III and group V elements respectively, onto a substrate, said process comprising the steps of:

contacting said substrate with a coordination compound in the gaseous phase, said compound having the formula:





wherein M(III) and M'(V) are bonded to one another by a donor/acceptor bond and wherein R_1, R_2, R_3, R_4, R_5, and R_6 are chemical radicals other than hydrogen; at least one of said radicals of R_1, R_2, and R_3 being an electron donor serving to stabilize said donor/acceptor bond between said elements M(III) and M'(V); and

thermally decomposing said coordination compound so as to break the chemical bonds between said radicals and said elements M(III) and M'(V) without breaking said donor-/acceptor bonds so as to cause said semi-conductor composition to deposit onto said substrate.

4,250,206

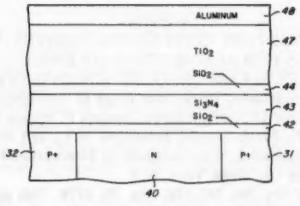
METHOD OF MAKING NON-VOLATILE SEMICONDUCTOR MEMORY ELEMENTS

Robert T. Bate, Garland, and Henry B. Morris, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 11, 1978, Ser. No. 968,545

Int. Cl.³ H01L *21/316, 21/318*

U.S. Cl. 427—88 **11 Claims**



1. A method of making a semiconductor memory element comprising the steps of:

forming a first layer of silicon dioxide upon a silicon substrate;

forming a layer of silicon nitride upon said first oxide layer;

forming a second layer of silicon dioxide upon said nitride layer;

depositing a layer of titanium upon said second oxide layer;

oxidizing said titanium layer in an oxidizing ambient between 200 Degrees C. and 1200 Degrees C. to form a type of titanium dioxide known as rutile; and

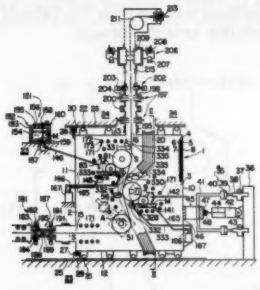
forming a conducting layer upon said titanium dioxide layer.

4,250,207

METHOD FOR APPLYING COATING OF MOLTEN METALS

Hisashi Takahashi; Satoshi Hanai, and Katsuyoshi Yoshida, all of Toukai, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed May 29, 1979, Ser. No. 43,096
Claims priority, application Japan, May 29, 1978, 53-63317
Int. Cl.[3] C23C *1/02, 1/08, 1/16*
U.S. Cl. 427—211 6 Claims



1. A method of applying a coating of molton plating metal to a strip, comprising the steps of heating a metal strip to a temperature suited for plating with a molten plating metal, feeding the thus heated metal strip through a reducing or inert atmosphere heated to a temperature suited for molten metal plating, providing horizontally disposed power-driven coating rolls adjacent the path of the strip through said atmosphere and on opposite sides of the strip, continuously supplying a molten plating metal to the peripheral surface of each coating roll, and guiding the strip through the atmosphere by at least one horizontally disposed deflector roll, and when it is desired to coat both sides of said strip, moving said coating rolls and said strip relative to each other for bringing said coating rolls and strip in contact to transfer plating metal from the coating rolls to the opposite sides of said strip, and when it is desired to coat only one-side of said strip, moving said coating rolls and said strip relative to each other for bringing coating roll on the side of said strip which it is desired to coat into contact with said strip to transfer plating metal from the coating roll to the said side of the strip, and when it is desired to coat neither of said strip, moving said coating rolls and said strip relative to each other for keeping said coating rolls and said strip out of contact.

4,250,208

METHOD FOR FORMING A TWO-LAYERED CARBIDE SURFACE ON A FERROUS-ALLOY ARTICLE AND RESULTING PRODUCT

Tohru Arai, Toyoake, Japan, assignor to Kabushiki Kaisha Toyota Chuo Kenkyusho, Nagoya, Japan

Filed Jun. 12, 1979, Ser. No. 47,919
Claims priority, application Japan, Jun. 19, 1978, 53-73922
Int. Cl.[3] C23C *9/10, 11/04*
U.S. Cl. 427—249 10 Claims

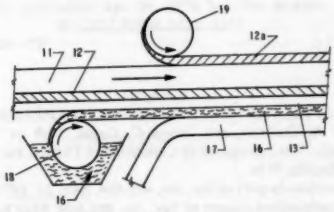
1. A method for forming a two-layered carbide surface on a ferrous-alloy article containing at least 0.2 percent by weight of carbon which comprises the steps of plating the surface of the ferrous-alloy article with chromium to form a chromium-plated layer thereon, and heating the resulting plated article in a medium containing at least one element selected from the group consisting of Group-Va elements and chromium to diffuse carbon from the ferrous-alloy article into the chromium-plated layer and thus convert said chromium-plated layer into an intermediate chromium-carbide layer, and thereafter to combine diffused carbon in the intermediate chromium-carbide layer with the element to form an outer carbide layer on the intermediate chromium-carbide layer.

4,250,209

TRANSFER METALLIZING PROCESS AND PRODUCT PRODUCED THEREBY

Johannes A. N. de Leeuw, Apeldoorn, and Johannes T. Brugmans, Enkhuizen, both of Netherlands, assignors to Lurex B.V., Netherlands

Filed May 10, 1978, Ser. No. 904,700
Int. Cl.[3] C23C *13/02, 13/04;* B05D *5/10*
U.S. Cl. 427—250 12 Claims



1. In the process for the application of a thin, coherent metallic stratum to a major surface of a non-metallic substrate, the improvement therein which comprises:

(a) coating a major surface of a polypropylene film, the surface of which has not been subjected to any pretreatment with a release agent having the capacity to effect a weak, releasable bond with the surface of the polypropylene film and a strong, non-releasable bond with the surface of a stratum of metal which has been freshly vapor deposited;

(b) precipitating a thin, coherent stratum of metal upon the coated surface of the polypropylene film by vapor deposition;

(c) applying simultaneously (1) a layer of a standard laminating adhesive to the exposed stratum of metal and bonding said stratum of metal to a non-metallic substrate by standard laminating techniques, whereby the following composite structure is prepared: polypropylene film/release agent coating/vapor deposited metal stratum/laminating adhesive layer/non-metallic substrate, and (2) a coating of the release agent to the free major surface of the polypropylene film; and

(d) stripping the polypropylene film from said composite structure.

4,250,210

CHEMICAL VAPOR DEPOSITION

Jeffrey N. Crosby, Kidderminster, and Robert S. Hanley, Stoke Prior, both of England, assignors to The International Nickel Co., Inc., New York, N.Y.

Continuation-in-part of Ser. No. 685,426, May 11, 1976, abandoned. This application Dec. 27, 1977, Ser. No. 864,820
Int. Cl.[3] C23C *11/02*
U.S. Cl. 427—252 4 Claims

1. A process for depositing metallic ruthenium on a hot substrate comprising

A. providing a solid, sublimable complex of ruthenium with a compound of formula $R_1—CO—CHR_2—CO—R_3$, wherein each of R_1 and R_3, which may be the same or different, is an alkyl, haloalkyl, alkoxy, aryl, or alkyl-, nitro-, or halosubstituted aryl group and R_2 is a hydrogen atom or an alkyl or haloalkyl group;

B. subjecting said solid complex of ruthenium to a pressure of less than about 10 torr in a chamber

C. heating said solid complex of ruthenium in said chamber

to a temperature below its melting point to provide in said chamber vapor of said ruthenium complex;

D. causing said vapor of said ruthenium complex to randomly impact on a substrate in said chamber separately heated to a temperature at which said ruthenium complex decomposes; and

E. carrying out B, C and D aforesaid while maintaining a substantially constant static partial vacuum in said chamber,

whereby vapor of ruthenium complex impacting on the heated substrate is caused to thermally decompose on said substrate to provide on said substrate a rapid build-up of a uniform layer of ruthenium metal.

4,250,211

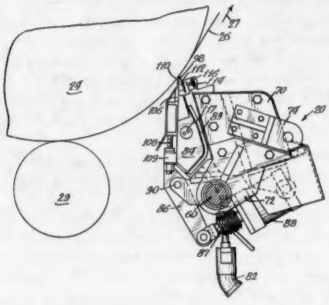
PAPER COATING METHOD AND APPARATUS

Wayne A. Damrau, and James C. Gauss, both of Wisconsin Rapids, Wis., assignors to Consolidated Papers, Inc., Wisconsin Rapids, Wis.

Continuation-in-part of Ser. No. 863,464, Dec. 22, 1977, which is a continuation-in-part of Ser. No. 683,669, May 6, 1976, abandoned. This application May 31, 1978, Ser. No. 911,126

Int. Cl.[2] B05D *3/12*

U.S. Cl. 427—356 **15 Claims**



1. A method of applying coating liquid to a moving web of paper comprising the steps of

applying coating liquid under pressure to one surface of a moving web of paper through a limited application zone having spaced front and rear edges and laterally spaced side edges,

forming and maintaining a reservoir of coating liquid under pressure on the web in the application zone between the front, rear and side edges thereof,

doctoring the coating liquid on the web at the rear edge of said application zone while the coating liquid is maintained under pressure,

maintaining the coating liquid in the application zone under pressure by substantially sealing the side edges of the zone and by establishing a liquid seal in a gap defined between the web and the front edge of said application zone which extends substantially across the width of the web, and

continuously flowing coating liquid under pressure reversely of the direction of web travel through the gap to substantially completely and continuously fill said gap with coating liquid for forming said liquid seal, for sealing off the front edge of the application zone and preventing entry of air and foreign matter through the gap into the zone, and for continuously purging the coating application zone.

4,250,212

WET STRENGTH PAPER ADDITIVES

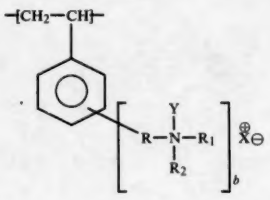
Donald N. Van Eenam, Des Peres, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 48,218, Jun. 13, 1979. This application Jan. 7, 1980, Ser. No. 110,263

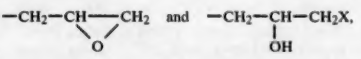
Int. Cl.[3] B05D *3/02, 3/04*

U.S. Cl. 427—386 **5 Claims**

1. A process for improving the wet strength of a fibrous cellulosic substrate which comprises treating the substrate with up to 16.8 kilos per metric ton of substrate of a polymeric wet strength additive wherein from 5 to 100% of the recurring units in the polymer have the formula



y is selected from



X is a radical serived from water-soluble proton acid, R is a C_1 to C_3 alkylene group, R_1 and R_2 are each substituted or unsubstituted C_1 to C_4 alkyl groups or, taken with the nitrogen together represent a saturated heterocyclic group, and b is an integer from 1 to 3.

4,250,213

UV-LIGHT-SENSITIVE SHEET FOR GRAPHIC APPLICATIONS

Ladislav Sandera, Schaffhausen, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Division of Ser. No. 893,897, Apr. 6, 1978, Pat. No. 4,197,354. This application Jun. 28, 1979, Ser. No. 52,839

Claims priority, application Switzerland, Apr. 18, 1977, 4754/77

Int. Cl.[3] B32B *15/08*

U.S. Cl. 427—409 **6 Claims**

1. A process for producing a UV-light-sensitive sheet for graphic applications comprising a first layer of an aluminum sheet or foil bearing a second layer of an anodized, unsealed and colored oxide film, an intermediate third layer on said second layer, and a fourth layer of UV-light-sensitive plastic on said intermediate layer, in which the intermediate layer is formed from a solution containing at least on copolymer which is soluble in polar solvents and is made up of a monomer listed in the following group:

(A) unsaturated ethers
unsaturated alcohols
unsaturated amines
unsaturated ketones
styrene

and a monomer of the group

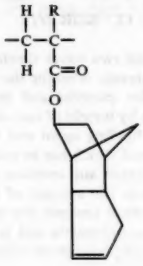
(B) unsaturated carboxylic acids, carboxylic acid salts, unsaturated carboxylic acid derivatives which can be hydrolyzed, including the steps of forming the said intermediate layer on the anodized, unsealed and colored oxide layer, followed by drying the said intermediate layer, followed by depositing a UV-light-sensitive plastic layer on the intermediate layer.

4,250,214
WOOD-POLYMER COMPOSITE CONTAINING A DICYCLOPENTENYL ACRYLATE OR METHACRYLATE POLYMER

William E. Broxterman, and Frederick L. Brown, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 23, 1976, Ser. No. 660,552
Int. Cl.[2] B32B *23/08, 27/10*
U.S. Cl. 428—514 3 Claims

1. A wood-polymer composite comprising a wood substrate impregnated with a dicyclopentenyl acrylate or methacrylate polymer, the polymer consisting of 100 weight percent of the component



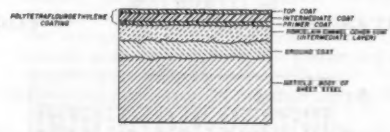
(I)

wherein R is hydrogen or methyl.

4,250,215
COOKING UTENSIL WITH NON-STICK COOKING SURFACE

Morrie M. Mayer, Terre Haute, Ind., assignor to General Housewares Corp., Terre Haute, Ind.

Filed Feb. 26, 1979, Ser. No. 14,838
Int. Cl.[3] B32B *15/18, 17/10;* B65D *25/14*
U.S. Cl. 428—35 6 Claims

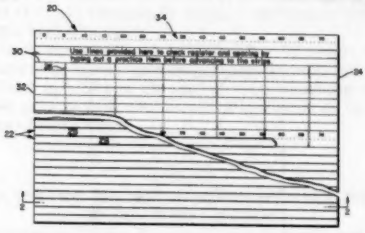


1. A cooking utensil having a non-stick coating on at least the food-contacting surfaces thereof, said cooking utensil comprising; a body sheet formed of a material selected from the group consisting of cold rolled steel and enameling iron, said body sheet having a non-stick coating tenaciously secured to the surfaces thereof that are presented toward foods to be cooked, said non-stick coating being of composite construction including an inner layer intimately bonded to the adjacent surface of said body sheet, an intermediate layer intimately bonded to said inner layer and an outer layer intimately bonded to said intermediate layer, said inner layer consisting essentially of porcelain enamel formed of a ground coat frit fired on the adjacent surface of said body sheet, said outer layer consisting essentially of a non-stick plastic material, said ground coat frit consisting essentially of about 82% by weight of a mixture of feldspar and borax and quartz and of about 16% by weight of a mixture of soda ash and sodium nitrate and fluorspar and of about 2% by weight of a mixture of cobalt oxide and manganese oxide and nickel oxide, said intermediate layer consisting essentially of from about 31% by weight to about 60% by weight of said ground coat frit and from about 21% by weight to about 50% by weight of titanium white cover coat frit and from about 3% up to 7% by weight of clay and from about 0.13% by weight to about 0.19% by weight of bentonite and from about 0.21% by weight to about 0.27% by weight of magnesium carbonate and from about 0.13% by weight to about 0.19% by weight of sodium nitrite and from about 11% by weight to about 13% by weight of matting glaze, the sum of the percent by weight of said ground coat frit and said titanium white cover coat frit being in the range from about 79% by weight to about 83% by weight.

4,250,216
VISIBLE INDEXES

Alexander P. Janssen, 28 Old Farm Rd., Bellair, Charlottesville, Va. 22903

Continuation of Ser. No. 795,881, May 11, 1977, abandoned, which is a division of Ser. No. 505,078, Sep. 11, 1974, abandoned.
This application Apr. 16, 1979, Ser. No. 30,458
Int. Cl.[3] B32B *3/14, 3/16*
U.S. Cl. 428—78 2 Claims

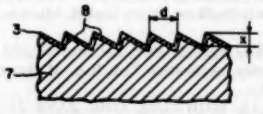


1. A flexible visible index strip of multiple ply construction which has smooth edges and comprises a first, strong, flexible ply composed of a fibrous, cellulosic mat impregnated with from 25 to 75 percent by weight of a partially cured, resin modified, cross-linked ureaformaldehyde resin; a second ply made of paper; and means bonding said second ply in face-to-face relationship with said first ply and leaving exposed a surface of the second ply on which selected information can be placed.

4,250,217
DOCUMENTS EMBOSSED WITH MACHINE-READABLE INFORMATION BY MEANS OF AN EMBOSSING FOIL

David L. Greenaway, Birchwil, Switzerland, assignor to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Filed Nov. 1, 1976, Ser. No. 737,217
Claims priority, application Switzerland, Nov. 17, 1975, 14847/75
Int. Cl.[3] B32B *3/28, 27/10*
U.S. Cl. 428—161 5 Claims



1. A document including a machine-readable relief structure in at least a portion of the surface area, comprising:
a document of paper or cardboard;
a thermoplastic layer transferred to the document from an embossing foil by means of a hot embossing die,
said thermoplastic layer having a thickness less than the profile depth of the relief structure;
a relief structure providing optical markings having a light specular reflecting and refracting properties with line

spacings less than 0.1 mm being embossed into the document by said hot embossing die

said thermoplastic layer covering the embossed surface of said document and adapting closely to the relief structure embossed in the document.

to compensate for surface roughness of said document and to provide light-modifying optical markings having a relatively smooth surface corresponding to the embossing surface of said embossing die.

4,250,218

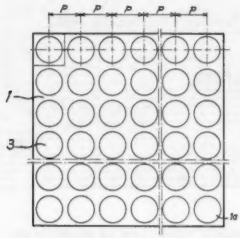
FLOOR COVERING

Roger Tallon, Paris, France, assignor to Design Programmes, Paris, France

Continuation-in-part of Ser. No. 959,448, Nov. 13, 1978, abandoned, which is a continuation of Ser. No. 794,622, May 2, 1977, abandoned. This application Jul. 25, 1979, Ser. No. 60,620

Int. Cl.³ B32B *3/00, 3/30*

U.S. Cl. 428—166 **8 Claims**



1. A tile floor covering comprising a sheet of hard resilient material having a Shore hardness within the range of 75 to 95, said sheet including upper and lower faces with said lower face being adapted to rest on a floor to be covered and said upper face acting as an exposed wear surface, and a plurality of hollow cells formed in said sheet, each of which opens at a respective base thereof on the lower face of said sheet with said base including the greatest dimension of the respective cell, said hollow cells being regularly spaced and separated from one another by planar portions of the sheet, wherein the ratio of the total surface area of such planar portions at the lower face to the total area of the bases of said hollow cells on the lower face of the sheet is between 0.5 and 5, said sheet further having a substantially uniform thickness throughout said hollow cells and planar portions, wherein the ratio of the thickness of the sheet to said greatest dimension of the hollow cells at the bases thereof is between 0.1 and 0.2.

4,250,219

LACQUER COATING, ESPECIALLY ON METAL SURFACES

Dieter Pogoda, Hamburg, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 28, 1976, Ser. No. 680,903

Claims priority, application Fed. Rep. of Germany, May 2, 1975, 2519559

Int. Cl.³ B32B *15/08, 27/04, 27/08, 27/06*

U.S. Cl. 428—212 **9 Claims**

1. A lacquer coated surface comprising a substrate, a heat cured substantially insoluble polyurethane base primer on said substrate, an intermediate layer of a non-cross-linked polyamide soluble in alcohol on said polyurethane base primer, and an external polyurethane base lacquer layer on said intermediate layer.

4,250,220

COMPOSITE PANEL WITH TWO OUTER LAYERS AND A CENTRAL CORE

Reinhard Schlatter, and Arnold Grass, both of Schaffhausen, Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Aug. 13, 1979, Ser. No. 66,069

Claims priority, application Switzerland, Aug. 31, 1978, 9195/78

Int. Cl.³ B32B *5/16*

U.S. Cl. 428—212 **7 Claims**

1. Composite panel with two cover sheets and a core therebetween and bonded thereto, wherein the core comprises a mixture of granular filler material and an organic binding agent, in which 100 parts by weight of core material is made up of 5–15 weight percent binding agent and 85–95 weight percent granular filler material which has an average grain diameter of more than 100 microns and contains at least 50 weight percent $Al(OH)_3$, wherein the amount of binding agent decreases from the cover sheet towards the center of the core, wherein said panel is incombustible and is characterized by good strength and elasticity and good adhesion between the cover sheets and the core.

4,250,221

FIBERGLASS MAT

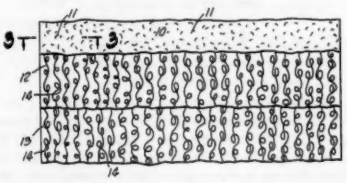
John R. Pfeffer, Bakersfield, Calif., assignor to Consolidated Fiberglass Products Co., Bakersfield, Calif.

Continuation-in-part of Ser. No. 868,725, Jan. 11, 1978, Pat. No. 4,135,029, which is a continuation-in-part of Ser. No. 681,422, Apr. 29, 1976, abandoned. This application May 30, 1978, Ser. No. 910,700

The portion of the term of this patent subsequent to Jan. 15, 1996, has been disclaimed.

Int. Cl.³ B32B *17/00*

U.S. Cl. 428—284 **6 Claims**



1. A fiberglass mat comprising

a base formed by a wet process and having dispersed glass fibers bonded together by a bonding agent, said base having

a top surface and

a bottom surface,

at least one distinct and separated layer of randomly oriented fiberglass strands within said base and located within a predetermined first plane intermediate said top surface and said bottom surface,

at least one distinct and separated layer of substantially longitudinally oriented fiberglass strands within said base and located within a predetermined second plane intermediate said top surface and said bottom surface, said first and second planes being substantially parallel to one another and separated by glass fibers and bonding agent in said base, and

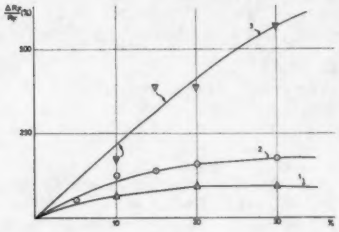
a relatively dense plurality of fiberglass strands within said base located within at least one of said first and second planes.

4,250,222

PROCESS FOR MANUFACTURING FINISHED AND SEMI-FINISHED PRODUCTS FROM MIXTURES OF VARIOUS SYNTHETIC RESIN SCRAP MATERIALS

Gerard F. G. Mavel; Emile M. J. Morel, both of Paris, and Gabriel M. Richert, Bretigny sur Orge, all of France, assignors to Institut National de Recherche Chimique Appliquee, Paris, France

Filed Dec. 29, 1975, Ser. No. 644,952
Claims priority, application France, Dec. 31, 1974, 74 43507
Int. Cl.[3] C08K *7/02, 7/04, 7/14*
U.S. Cl. 428—285 10 Claims



1. A process for compatibilizing mixed mutually incompatible thermoplastic synthetic resins which comprises:

(a) coarsely grinding a mixture of mutually incompatible thermoplastic resin scraps;

(b) incorporating into the coarsely ground mixture of incompatible thermoplastic resin scraps through the application of heat and pressure

(i) from 5 to about 25 parts % by weight of a fibrous material, the individual fibers in said fibrous material having an average length equal to at least three times the average size of the fragments constituting the coarsely ground thermoplastic resin mixture, and when special characteristics are sought,

(ii) from 0 to about 20 parts % by weight of a non fibrous convenient additive, and

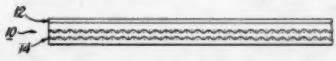
(c) forming the resin/fiber mass into finished or semifinished articles.

4,250,223

BELT TYPE EXPANSION JOINTS

Francis E. Cook, Downers Grove, Ill., assignor to Dearborn Rubber Company, Westmont, Ill.

Filed Jul. 7, 1978, Ser. No. 922,561
Int. Cl.[3] B32B *15/08;* B65G *15/34;* F16G *1/26*
U.S. Cl. 428—285 11 Claims



1. A multilayer article of manufacture having properties of thermal insulation and chemical resistance comprising a heat shield comprising a heat contacting layer of metal foil and a layer of a polyester disposed directly under said metal foil layer, said heat shield being secured to a layer of a heat-stable elastomer having a heat insulating fabric embedded therein and said heat shield being secured to said layer of elastomer by vulcanization of said elastomer while said elastomer is in contact with said heat shield.

4,250,224

PLASTICS MATERIAL AND METHOD OF PRODUCING SAID MATERIAL

Berthold Newitzki, Friedrichsdorf, Fed. Rep. of Germany, assignor to Firma Erich Ruhl Chemische Fabrik und Chemikalien-Grosshandel, Friedrichsdorf, Fed. Rep. of Germany

Division of Ser. No. 46,012, Jun. 6, 1979. This application Apr. 4, 1980, Ser. No. 137,485
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1978, 2825295
Int. Cl.[3] B32B *27/42*
U.S. Cl. 428—310 10 Claims

1. A method of producing a non-combustible material which does not develop toxic fumes when subject to heat, comprising:

reacting a mixture of

(a) 62 to 76 percent by weight of aluminium oxide or aluminium hydroxide;

(b) 12 to 16 percent by weight of phenol resin; and

(c) 11.5 to 17.5 percent by weight of furfuryl alcohol with

(d) a hardening agent

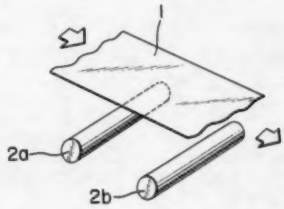
in such an amount that the proportion by weight of the hardening agent functional group amounts to about 1/10th to 1/20th of the amount of the aluminium oxide, and prior to hardening is applied to a substrate or introduced into a mould.

4,250,225

PROCESS FOR THE PRODUCTION OF A MAGNETIC RECORDING MEDIUM

Ryuji Shirahata; Tatsuji Kitamoto; Masaaki Suzuki, and Hiroshi Amari, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Continuation of Ser. No. 841,323, Oct. 11, 1977, abandoned, which is a continuation of Ser. No. 624,282, Oct. 20, 1975, abandoned. This application Jul. 24, 1978, Ser. No. 927,037
Claims priority, application Japan, Oct. 28, 1974, 49-123468
Int. Cl.[3] H01F *10/00*
U.S. Cl. 428—336 4 Claims



1. A process for the production of a magnetic recording medium, said process comprising:

treating the surface of a plastic substrate by glow discharge at a voltage of 0.1 to 5.0 KV in an inert atmosphere with a degree of vacuum of 0.01 to 0.5 Torr;

said plastic substrate being selected from the group of materials consisting of polyethylene terephthalate, polyethylene naphthalate, polypropylene, cellulose triacetate, polycarbonate, polyvinyl chloride and polyimide;

subjecting said plastic substrate treated by glow discharge to a liquid phase surface activating treatment using materials consisting of:

(a) a sensitizer consisting of a hydrochloric acid solution of stannous chloride and an activator containing a noble metal ion, or

(b) a catalyst consisting of a hydrochloric acid solution containing stannous ion, stannic ion and a noble metal ion, an accelerator; and

forming a magnetic metallic layer having a thickness of 0.05–1.0μ on the substrate in an electroless plating bath using an aqueous solution containing 0.2 to 0.6 mol/l of

cobalt ion, 0 to 0.02 mol/l of nickel ion and 0.03 to 0.4 mol/l of hypophosphite ion as a reducing agent, the pH of said plating bath being in the range of 6.5–9.0, the temperature of said bath being in the range of 60°–90° C., and the plating rate being 50–5000 A/min.

2. A magnetic recording medium produced by the process as claimed in claim 1.

4,250,226

METHOD FOR PRODUCING AN ADHESIVE-COATED HIGH-STRENGTH STEEL REINFORCING MEMBER

Thomas E. Graham, Raleigh, N.C.; George H. Thaxton, Charleston, S.C.; Francis M. Mitchell, Chapel Hill, and Robert P. Bell, Cary, both of N.C., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 598,591, Jul. 3, 1975, Pat. No. 3,998,993. This application Dec. 2, 1976, Ser. No. 746,768
Int. Cl.[3] B32B *15/18;* D02G *3/36, 3/40, 3/48*
U.S. Cl. 428—344 5 Claims

1. A coated steel reinforcing member, comprising:

a steel substrate having a composition within the limits defined by the grade numbers AISI 1030 to AISI 1095 and a quenched structure of martensite, bainite or mixtures thereof; and

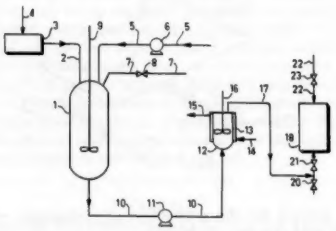
a continuous organic adhesive coating on the surface of said substrate wherein the interface between said substrate and said coating is characterized by a layer of degraded adhesive.

4,250,227

MICRON SIZE POLYMERIC COATING AND RELATED METHODS

Bruno Claude, and Richard Le Fustec, both of Le Havre, France, assignors to Compagnie Francaise de Raffinage, Paris, France

Filed Mar. 27, 1978, Ser. No. 890,531
Claims priority, application France, Apr. 6, 1977, 77 10398
Int. Cl.[3] B32B *27/08;* B05D *3/02;* B32B *15/08, 27/00*
U.S. Cl. 428—461 30 Claims



27. A method of making a composite film formed of a polyethylene or polypropylene film and of an aluminum film comprising:

I. coating a support film of aluminum, polyethylene, or polypropylene with a graft copolymer layer by the steps comprising:

(a) preparing a suspension comprising particles of a graft copolymer, obtained by polymerization of ethylene or propylene and grafting with acrylic acid, by quenching to effect a rapid cooling of a solution of said copolymer in an organic liquid at a concentration and to a temperature effective to precipitate the copolymer as a suspension having an average particle size of less than 8 microns,

(b) coating the support film with said copolymer suspension, and

(c) eliminating the organic liquid from the resulting coating by heating to a sufficient temperature to drive off the organic liquid and give a layer having a thickness in the neighborhood of about 1 micron; and

II. bonding the resulting coated support film to a second film of aluminum, polyethylene or polypropylene with heat.

28. The method according to claim 27, wherein during the bonding step the graft copolymer is heated sufficiently to fuse.

29. The method in accordance with claim 28, wherein the acrylic acid content of the graft copolymer is 0.5 wt. %.

30. A film composite made by a method in accordance with claims 29, 27, or 28.

4,250,228

ELECTROSTATIC RECORD ELEMENT OF ELECTROCONDUCTIVE BASE SHEET COATED WITH RESIN LAYER CONTAINING ZNO POWDER OF SPECIFIED RESISTIVITY

Hironari Fujioka, Amagasaki, Japan, assignor to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

Filed Jun. 29, 1979, Ser. No. 53,424
Claims priority, application Japan, Jul. 4, 1978, 53-81794
Int. Cl.[3] B32B *9/04;* G02B *5/30*
U.S. Cl. 428—539 5 Claims

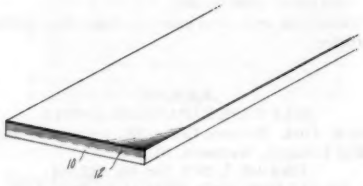
1. An electrostatic record material comprising an electroconductive base sheet and a record layer formed on the base sheet containing an insulating resin, wherein the electroconductive base sheet has an electroconductive layer containing (i) a zinc oxide powder having a specific resistivity of 0.01 to 500 ohm-cm at pressure of 150 kg/cm^2 measured after standing at 20° C. and 60% RH for 2 hours, and (ii) a water-soluble or water-dispersible adhesive resin, the zinc oxide powder being prepared by admixing with zinc oxide a small amount of at least one of Al_2O_3, Cr_2O_3, Ga_2O_3, In_2O_3 and a compound which produces such an oxide when heated at a high temperature, and heating the mixture at a high temperature.

4,250,229

INTERLAYERS WITH AMORPHOUS STRUCTURE FOR BRAZING AND DIFFUSION BONDING

Bernard H. Kear, Madison, and William H. King, Higganum, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 4, 1979, Ser. No. 26,985
Int. Cl.[3] B22F *5/00*
U.S. Cl. 428—606 14 Claims



1. An interlayer foil for joining metal workpieces, characterized by a desired composition having a melting point less than the metals being joined and a capability of forming a metallurgical bond with the workpieces upon resolidifying from a melt as a crystalline solid while in contact with the workpieces, and a portion of at least 30 percent by volume which is amorphous, the portion being a continuous stratum on at least one surface of the interlayer, the balance of the interlayer being a crystalline solid integrally attached to the amorphous portion.

9. The method of joining at least two metal workpieces comprising:

providing an interlayer having a composition with a melting point less than the metals being joined and a capability, with respect to the workpiece, of dissolving minor surface films, alloying and forming a good metallurgical bond

upon solidification, and having at least one continuous surface stratum with an amorphous structure, the interlayer further having at least 30 volume percent amorphous structure;

interposing the interlayer between the faying surfaces of the workpieces to form an assembly;

heating the assembly above the interlayer melting temperature, to cause the interlayer to liquify within the joint;

holding the assembly at a temperature above the interlayer melting point a sufficient time to cause a desired metallurgical interaction of the interlayer and the workpieces;

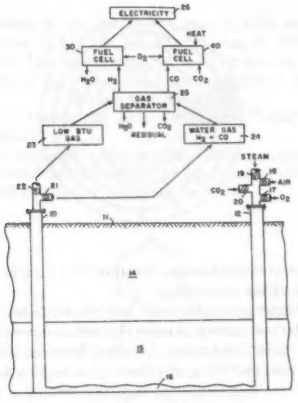
cooling the assembly to produce an assembly with a solid interlayer having a crystalline structure with strong metallurgical bonds to the workpieces.

4,250,230

GENERATING ELECTRICITY FROM COAL IN SITU

Ruel C. Terry, Denver, Colo., assignor to In Situ Technology, Inc., Denver, Colo.

Filed Dec. 10, 1979, Ser. No. 101,869
Int. Cl.³ H01M 8/00
U.S. Cl. 429—12 **8 Claims**



1. A method of generating electricity from fuel derived by producing coal in situ utilizing fuel cells, comprising the steps of

drilling a first well from the surface of the ground into an underground coal formation,

drilling a second well from the surface of the ground into the coal formation, the second well being spaced apart from the first well,

establishing a communication passage through the underground coal in fluid communication between the first well and the second well,

igniting the coal in the communication passage,

establishing a reaction zone in the communication passage,

withdrawing low BTU gas from the reaction zone,

establishing an above ground gas separator, the gas separator being capable of separating the low BTU gas into discrete component streams consisting of H_2, CO, H_2O, CO_2 and a mixed residual,

establishing a first fuel cell in an above ground location,

establishing a source of oxygen in an above ground location,

injecting low BTU gas from the reaction zone into the above ground gas separator,

separating the low BTU gas into discrete component streams consisting of H_2, CO, H_2O, CO_2 and mixed residual,

withdrawing hydrogen from the gas separator,

injecting hydrogen into the first fuel cell,

injecting oxygen into the first fuel cell, and

generating electricity in the first fuel cell.

6. A system for generating electricity from coal in situ comprising in combination:

a first well drilled from the surface of the earth into an underground coal formation, the first well including means for injecting reactants into the coal formation,

a second well drilled from the surface of the earth into the coal formation, the second well including means for withdrawing fluids from the coal formation,

a communication means through the underground coal formation, the communication means being in fluid communication with the first well and with the second well,

a gas separator means for separating from produced gas stream the individual components consisting of hydrogen, carbon monoxide, water, carbon dioxide and a mixed residual, the gas separator means being in fluid communication with the second well,

a first fuel cell capable of generating electricity, the first fuel cell being in fluid communication with the gas separator means, and

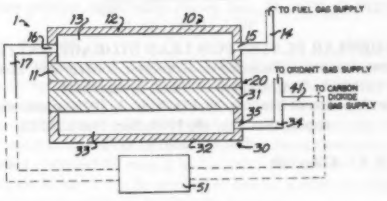
a source of oxygen means in fluid communication with the first fuel cell.

4,250,231

ACID ELECTROLYTE FUEL CELL METHOD HAVING IMPROVED CARBON CORROSION PROTECTION

Hansraj C. Maru, Brookfield Center, Conn., assignor to Energy Research Corporation, Danbury, Conn.

Filed Mar. 23, 1979, Ser. No. 23,097
Int. Cl.³ H01M 8/04
U.S. Cl. 429—13 **7 Claims**



1. A method of generating electrical energy through electrochemical interaction comprising the steps of:

providing a cell for subjecting an anode means to a fuel gas to generate free positive ions, for conveying the free positive ions to a cathode means, and for subjecting the cathode means to an oxidant gas;

providing a carbon means within said cathode means;

and supplying carbon dioxide gas to the region of said cell adjacent said carbon beams in sufficient amount to inhibit corrosion of said carbon means.

4,250,232

SAFETY ENCLOSURE ASSEMBLY FOR STORAGE BATTERIES

J. E. Davidson, 242 Thompsonville Rd., McMurray, Pa. 15317

Filed May 18, 1979, Ser. No. 40,402
Int. Cl.³ H01M 2/12
U.S. Cl. 429—56 **7 Claims**

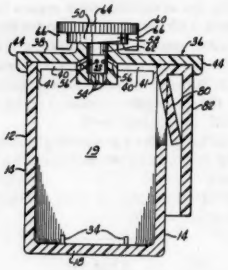
1. Safety enclosure assembly for storage batteries, comprising:

an elongated container having interconnecting side walls, end walls and a base, and including a series of cells defined by cell walls arranged within the confines of the container;

gas diverter means for directing and containing the flow of high pressure gases above a predetermined magnitude from any of the upper regions of any of said cells externally of said container and downwardly along at least one of said side walls of said container and toward said base; said gas diverter means including a blow-out section

formed on the upper regions of a side wall of said container, constructed and arranged such that said sections will be displaced outwardly of the side wall at a predetermined internal gas pressure to form an opening, and channel means secured to said container defining a downwardly directed passageway for said blow-out sections;

rib-strengthened cover means for closing the top of said container;



fill opening means defined in said cover means communicating with each of said cells for receiving and directing liquids into said cells and for arresting the flame of any burning gases passing therethrough; and

removable cap means for closing the fill opening means and for permitting the discharge of gases from said cells.

4,250,233

TUBULAR PLATES FOR LEAD STORAGE BATTERIES

Rene Jeanneret, Tuileries-de-Grandson, Switzerland, assignor to Leclanche S.A., Canton of Vaud, Switzerland

Continuation of Ser. No. 16,438, Mar. 1, 1979, abandoned. This application Feb. 19, 1980, Ser. No. 122,522

Int. Cl.³ H01M *4/76*

U.S. Cl. 429—140 **6 Claims**

1. In combination with a tubular plate for lead storage batteries of the type wherein a plurality of grid rods are connected at the top to form a grid, said grid rods are housed in tubes, said tubes have an oval shape in cross-section and each contains at least two spaced said grid rods as current conductors, each of said grid rods having a plurality of centering lugs therealong and projecting therefrom in a direction toward each said tube, the improvement which comprises at least one thin crosspiece connecting together only said at least two grid rods in each of said tubes near the bottom of said grid rods and below each said plurality of centering lugs, each said thin crosspiece being a unitary bar having a thickness substantially less than the diameter of said grid rods which it connects together, and said oval-shaped cross-section of the tubes being a greatly flattened oval shape which is substantially that of a rectangle having rounded corners.

4,250,234

DIVALENT SILVER OXIDE CELL

Richard A. Langan, Parma, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Sep. 28, 1979, Ser. No. 79,885

Int. Cl.³ H01M *6/06*

U.S. Cl. 429—206 **13 Claims**

1. A silver oxide cell having an alkaline electrolyte, a negative electrode, a divalent silver oxide-containing positive electrode and a separator disposed between the negative electrode and the positive electrode and wherein the improvement comprises at least a major portion of the surface of the divalent silver oxide-containing positive electrode facing the separator reduced to monovalent silver oxide with the remaining surfaces of the positive electrode being substantially divalent silver oxide.

4,250,235

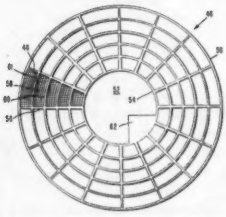
BATTERY ELECTRODE STRUCTURE

Preston S. DuPont, Northridge, and Howard H. Rogers, Torrance, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 16, 1979, Ser. No. 66,987

Int. Cl.³ H01M *4/02*

U.S. Cl. 429—211 **9 Claims**



1. An electro-mechanical substrate for a nickel hydrogen battery electrode comprising:

a nickel sheet metal electrode, said electrode being generally circular and having an inner rim and an outer rim, substantially radial conductors extending between said inner and outer rims and being of greater cross section adjacent said inner rim, said electrode substrate having a plurality of openings between said inner and outer rims and between said radial conductors to form a grid mesh, the edges of said rims and said conductors having an etched surface.

4,250,236

ADDITIVE FOR ACTIVATING IRON ELECTRODES IN ALKALINE BATTERIES

Friedrich Haschka, Esslingen, and Gerhard Berger, Stuttgart, both of Fed. Rep. of Germany, assignors to Firma Deutsche Automobilgesellschaft mbH, Hanover, Fed. Rep. of Germany

Filed Aug. 30, 1979, Ser. No. 71,584

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1978, 2837980

Int. Cl.³ H01M *10/24*

U.S. Cl. 429—221 **15 Claims**

1. An alkaline battery containing an iron electrode and an activating additive for said iron electrode, said additive comprising at least one substance from the class consisting of sulfide, telluride and selenide, said substance being sparingly soluble in the electrolyte of the battery and having a decomposition potential which is more negative than the final charging potential of the iron electrode, and said additive being placed in said battery separately from the active mass of the iron electrode.

4,250,237

P-TERPHENYL ORGANIC PHOTOCONDUCTORS AND HETEROGENEOUS COMPOSITIONS THEREOF

Richard S. Vickers, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 25, 1977, Ser. No. 800,601
Int. Cl.[3] G03G 5/04
U.S. Cl. 430—17 15 Claims

1. A method of producing a p-terphenyl photoconductor having high electrophotographic speed, which method comprises (a) forming a solution of p-terphenyl in a solvent having solubility parameters in about the following ranges:

δ_d: 7.1–8.3
δ_p: 1.4–5.1
δ_h: 2.8–8

and (b) crystallizing said p-terphenyl from said solution.

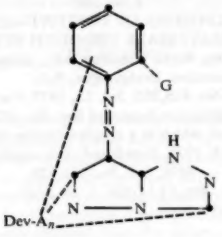
4,250,238

PHOTOGRAPHIC PRODUCTS AND PROCESSES EMPLOYING NOVEL DYE DEVELOPER COMPOUNDS

Brian D. Baigrie, New Denham; Joseph Bailey, Harrow; Linda G. Johnston, Harrow, and Miroslav V. Mijovic, Harrow, all of England, assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 16,998, Mar. 2, 1979, and a continuation-in-part of Ser. No. 822,188, Aug. 5, 1977, Pat. No. 4,142,891. This application Oct. 1, 1979, Ser. No. 80,753
The portion of the term of this patent subsequent to Jan. 15, 1997, has been disclaimed.
Int. Cl.[3] G03C 1/40, 1/10; C09B 45/00; G03C 7/00
U.S. Cl. 430—17 6 Claims

4. A photographic element comprising a support having thereon a coordination complex of a polyvalent metal ion and a compound having the following formula:



wherein:

G is a metal chelating group;
A is an organic divalent linking radical;
n is either 0 or 1; and
Dev is a dihydroxyphenyl substituent.

4,250,239

COLOR ELECTROSTATOGRAPHIC PROCESS AND MATERIAL

Katsuo Sakai, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 5, 1978, Ser. No. 912,273
Claims priority, application Japan, Jun. 9, 1977, 52/68343; Jun. 29, 1977, 52/77658; Jul. 11, 1977, 52/82660
Int. Cl.[3] G03G 13/01
U.S. Cl. 430—42 19 Claims

1. A two-color electrostatographic process utilizing a photoconductive material having a conductive substrate, a first photoconductive layer formed on the substrate and a second photoconductive layer formed on the first layer, said first and second layers having different spectral sensitivity, the process comprising the steps of:

(a) applying a first electrostatic charge of a polarity to the second layer, step (a) being performed while radiating the second layer with light to render only one of the first layer and the second layer photoconductive;
(b) applying a second electrostatic charge to the second layer in the absence of light to neutralize a portion of the first electrostatic charge on the second layer; and
(c) radiating a light image onto the second layer, magnitude of the first and second electrostatic charges being selected in such a manner as to form a substantially zero surface potential area, a first electrostatic iamge area of a first polarity and a second electrostatic iamge area of a second polarity opposite to the first polarity of the first electrostatic image area on the photoconductive material.

4,250,240

PHOTOSENSITIVE MATERIAL FOR USE IN ELECTROPHOTOGRAPHY

Masaru Shimada, Numazu; Shoji Maruyama, Yokohama, and Hiroshi Tamura, Fujisawa, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 19, 1979, Ser. No. 50,096
Claims priority, application Japan, Jun. 21, 1978, 53-74280
Int. Cl.[3] G03G 5/04
U.S. Cl. 430—66 5 Claims

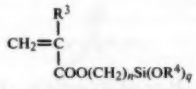
1. A photosensitive material for use in electrophotography which comprises an electroconductive substrate, a photoconductive layer coated on said electroconductive substrate and a transparent protective layer coated on said photoconductive layer, said transparent protective layer consisting essentially of a material obtained by partial hydrolysis of a mixture of

(a) from 70 to 98.9% by weight of one or a mixture of two or more compounds having the formula

$$(R^1)_l Si(OR^2)_m$$

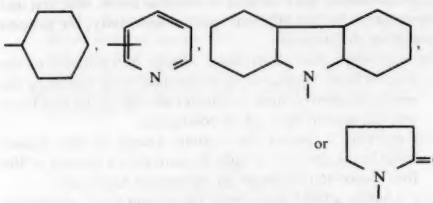
wherein R^1 is C_{1-4} alkyl, vinyl, γ-methacryloxypropyl, phenyl, γ-glycidoxypropyl, γ-chloropropyl, γ-mercaptopropyl, γ-β(aminoethyl)γ-aminopropyl or γ-aminopropyl; R^2 is a hydroxyethylalkyl ether or C_{1-4} alkyl; l is 0 to 2; m is 2 to 4,

(b) from 1 to 20% by weight of one or a mixture of two or more copolymers of first monomer having the formula



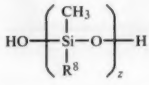
wherein R^3 is hydrogen or methyl; R^4 is hydrogen or C_{1-4} alkyl; n is 1 to 4; and q is 1 to 3, with second monomer selected from the group consisting of maleic anhydride and monomer having the formula

wherein R^5 is hydrogen or methyl; R^6 is —$COOR^7$, —CN, —$OCOCH_3$, —$CONH_2$,



and wherein R^7 is hydrogen or C_{1-12} alkyl, hydroxyalkyl, glycidyl or dimethylaminoalkyl, and

(c) from 0.1 to 10% by weight of one or a mixture of two or more compounds having the formula



wherein R^8 is C_{1-4} alkyl or phenyl; and z is 2 to 25.

4,250,241

LIQUID DEVELOPER FOR USE IN ELECTROPHOTOGRAPHY

Kazuo Tsubuko, Numazu; Taro Kimura, Tokyo; Motoo Tasaka, and Junichiro Hashimoto, both of Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 31, 1979, Ser. No. 71,447

Claims priority, application Japan, Sep. 6, 1978, 53-109261

Int. Cl.[3] G03G *9/12*

U.S. Cl. 430—114 **12 Claims**

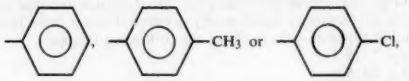
1. A liquid developer for use in electrophotography which comprises a carrier liquid comprising a non-aqueous solvent having a high insulating property and a low dielectric constant, said carrier liquid having a coloring agent and a resin dispersed therein, characterized in that said resin contains the following components (A) and (B):

(A) a polymer prepared by subjecting to polymerization conditions a solution of at least one kind of resin having an acetone tolerance value of 100–5000 dissolved in at least one kind of monomer capable of dissolving said resin whereby to polymerize said monomer, and

(B) a non-aqueous thermoplastic resin obtained by preparing a copolymer by copolymerizing a monomer having the formula I,

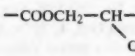
wherein R is —H or $—CH_3$ and X is $—COOC_nH_{2n+1}$ or $—OC_nH_{2n+1}$ ($6 \leqq n \leqq 20$), with a monomer selected from the group consisting of a monomer having a glycidyl group, an unsaturated carboxylic acid and an anhydride thereof, then esterifying said copolymer with said unsaturated carboxylic acid or anhydride thereof when said copolymer has a glycidyl group as a structural unit thereof or with said monomer having the glycidyl group when the copolymer has an unsaturated carboxylic acid or anhydride thereof as a structural unit thereof, and then further graft-polymerizing the unsaturated portion of the resulting esterification product with at least one monomer selected from the group consisting of monomer having the formula II

wherein R is —H or $—CH_3$ and Y is $—COOC_{n'}H_{2n'+1}$ ($1 \leqq n' \leqq 4$), $—OCOC_mH_{2m+1}$ ($1 \leqq m \leqq 6$),



and monomer having the formula III,

wherein R is —H or $—CH_3$ and Z is $—COOCH_2CH_2N(C_{n''}H_{2n''+1})_2$ ($1 \leqq n'' \leqq 5$), —COOH, $—COOC_2H_4OH$ or



4,250,242

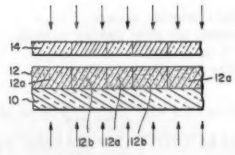
UNIFORM EXPOSURE OF POSITIVE-ACTING DIAZO TYPE MATERIALS THROUGH SUPPORT

August P. Doering, North Windham, Me., assignor to American Hoechst Corporation, Bridgewater, N.J.

Division of Ser. No. 815,355, Jul. 13, 1977, Pat. No. 4,154,613, which is a continuation-in-part of Ser. No. 652,249, Jan. 26, 1976, abandoned, which is a continuation-in-part of Ser. No. 189,104, Oct. 14, 1971, abandoned. This application Oct. 31, 1978, Ser. No. 956,528

Int. Cl.[3] G03C *1/58, 5/22*

U.S. Cl. 430—141 **9 Claims**



1. A method for preparing a material having a reduced time requirement for imagewise exposure to actinic light comprising

(A) providing a transparent or translucent support having a positive-acting quinone diazide light-sensitive coating composition in direct contact with one surface thereof, and

(B) uniformly exposing said coating through said support to a source of actinic light for a period of time sufficient to substantially photodecompose the surface of said coating in direct contact with said support and form a gradient in said coating wherein the percentage of undecomposed light-sensitive quinone diazide increases with increasing distance from said support.

4,250,243

PHOTOGRAPHIC ELEMENT FOR COLOR DIFFUSION TRANSFER PROCESS

Takashi Yoshida, and Shinji Sakaguchi, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation-in-part of Ser. No. 966,407, Dec. 4, 1978, abandoned. This application Sep. 14, 1979, Ser. No. 75,441
Claims priority, application Japan, Dec. 2, 1977, 52-144749
Int. Cl.[3] **G03C** *1/40, 1/48*
U.S. Cl. 430—215 **19 Claims**

1. In a photographic element for the color diffusion transfer process including a neutralizing system for reducing the pH of an aqueous alkaline developing solution which comprises a neutralizing layer and a timing layer, wherein the timing layer is positioned on or under the neutralizing layer in direct or indirect contact therewith such that the aqueous alkaline developing solution reaches the neutralizing layer through the timing layer, the improvement which comprises a timing layer comprising a polymer which is produced by emulsion polymerization of (1) each of (A) at least one monomer selected from the group consisting of ethylene-type monomers having at least one free carboxylic acid group, free sulfonic acid group or free phosphoric acid group or a salt thereof, (B) at least one monomer selected from the group consisting of monomers represented by the following general formula (I)

(I)

wherein X is a hydrogen atom, a methyl group or a $—COOR^1$ group; Y is a hydrogen atom, a methyl group or a $—(CH_2)_nCOOR^2$ group; Z is a monocyclic or bicyclic aryl group having 6 to 12 carbon atoms, a $—COOR^3$ group or a

R^1, R^2 and R^3, which may be the same or different, each represents a saturated aliphatic group having 1 to 12 carbon atoms or a monocyclic or bicyclic aryl group having 6 to 12 carbon atoms; and n is an integer of 0 to 3, and (C) at least one monomer selected from the group consisting of ethylene-type monomers having at least one glycidyl group or (2) each of (A) at least one monomer selected from the group consisting of the ethylene-type monomers described in (A) above, (B) at least one monomer selected from the group consisting of monomers represented by the general formula (I) above, (C) at least one monomer selected from the group consisting of the ethylene-type monomers described in (C) above, and (D) at least one monomer selected from the group consisting of monofunctional or polyfunctional unsaturated monomers other than those monomers described in (A), (B) and (C) above which are copolymerizable with the monomers described in (A), (B) and (C) above and selected from the group consisting of acrylamides, methacrylamides, vinyl ethers, vinyl ketones, allyl compounds, olefins, vinyl heterocyclic compounds, unsaturated nitriles and polyfunctional monomers, and the polymer latex layer per se has the water permeability.

4,250,244

THIACYANINE BETAINE BLUE SENSITIZING DYES

Alan L. Borror, Lexington, and Ruth L. Hill, Cambridge, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Feb. 2, 1977, Ser. No. 764,730
Int. Cl.[3] **G03C** *1/40, 1/16, 1/18, 1/20*
U.S. Cl. 430—217 **15 Claims**

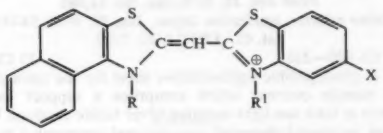
4. A photographic film unit which comprises, in combination:

a photosensitive element having a diffusion transfer image-receiving element affixed at least one edge thereof, said photosensitive element comprising a support carrying:

(a) a red-sensitive silver halide emulsion having associated therewith a cyan dye developer;

(b) a green-sensitive silver halide emulsion having associated therewith a magenta dye developer;

(c) a blue-sensitive silver halide emulsion having associated therewith a yellow dye developer; said blue-sensitive silver halide emulsion additionally including a 3,3'-disubstituted, 4,5-benzothia-thiacyanine betaine of the formula:



wherein R is ethyl or sulfopropyl, R^1 is sulfopropyl when R is ethyl and R^1 is ethyl when R is sulfopropyl and X is hydrogen;

said diffusion transfer image-receiving element comprising a support layer carrying:

an alkaline processing composition permeable and dyeable layer wherein said photosensitive and said image-receiving elements are adapted to be superposed, the support layers of each comprising the extremities of the superposed structure.

4,250,245

CONTROL OF DYE RELEASE IN COLOR TRANSFER ASSEMBLAGES USING BLOCKED COMPETING DEVELOPERS

Guy Gehin, Ozoir-La-Ferriere, and Eva Fage, Villiers-Sur-Marne, both of France, assignors to Eastman Kodak Company, Rochester, N.Y.

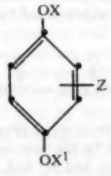
Continuation-in-part of Ser. No. 956,826, Nov. 2, 1978, abandoned. This application Aug. 17, 1979, Ser. No. 67,588
Claims priority, application France, Nov. 3, 1977, 77 32972
Int. Cl.[3] **G03C** *1/40, 7/00, 5/54, 1/10*
U.S. Cl. 430—218 **27 Claims**

11. In a photographic assemblage to be processed by an alkaline processing composition, said assemblage comprising:

(a) a photographic element comprising a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a ballasted, redox-dye-releasing compound; and

(b) a dye image-receiving layer;

the improvement wherein said emulsion layer contains a hydroquinone ester having the following formula:



wherein

X is hydrogen, COR or SO_2R;

X^1 is COR or SO_2R;

R is an alkyl group having from 1 to about 20 carbon atoms or an aryl group having from 6 to about 12 carbon atoms; and

Z is hydrogen, an alkyl group having from 1 to about 6 carbon atoms, an alkoxy group having from 1 to about 6

carbon atoms, or an aryl group having from about 6 to about 8 carbon atoms;

said ester being present in a concentration sufficient, upon hydrolysis, to reduce substantially all the silver in said silver halide emulsion.

4,250,246

PHOTOGRAPHIC LIGHT-SENSITIVE SHEET FOR THE COLOR DIFFUSION TRANSFER PROCESS

Isamu Itoh, and Yoshinobu Yoshida, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

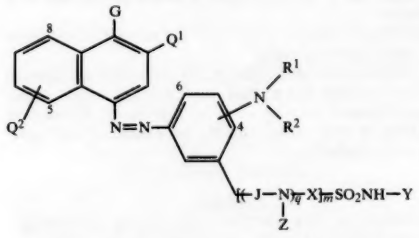
Filed Jun. 25, 1979, Ser. No. 51,585

Claims priority, application Japan, Jun. 23, 1978, 53-76162

Int. Cl.³ G03C *1/40, 7/00*

U.S. Cl. 430—223 **13 Claims**

1. A photographic light-sensitive sheet for the color diffusion transfer process which comprises a support having thereon at least one light-sensitive silver halide emulsion layer having associated therewith a compound represented by the following general formula (I):



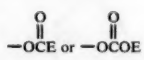
(I)

wherein

Q^1 represents a hydrogen atom; a halogen atom; a sulfamoyl group represented by the formula $—SO_2NR^3R^4$ wherein R^3 represents a hydrogen atom or an alkyl group, R^4 represents a hydrogen atom or an R^{4a} group wherein R^{4a} represents an alkyl group, an aralkyl group or a phenyl group, and R^3 and R^4 may combine directly or through an oxygen atom to form a ring; a group represented by the formula $—SO_2R^5$ wherein R^5 represents an alkyl group or an aralkyl group; a carboxy group; a group represented by the formula $—COOR^6$ wherein R^6 represents an alkyl group or a phenyl group; or a group represented by the formula $—CONR^3R^4$ wherein R^3 and R^4 each has the same meaning as defined above;

Q^2 is positioned at the 5- or the 8-position to the hydroxy group and represents a hydroxy group, a group represented by the formula $—NHCOR^{4a}$ or a group represented by the formula $—NHSO_2R^{4a}$ wherein R^{4a} has the same meaning as defined above;

G represents a hydroxyl group, a salt thereof, or a hydrolyzable acyloxy group represented by the formula



wherein E represents an alkyl group or a phenyl group;

R^1 and R^2, which may be the same or different, each represents an alkyl group; and R^1 and R^2 may combine with each other and represent an atomic group necessary to form a 5-membered or 6-membered heterocyclic ring;

m and q each represents 0 or 1;

J represents a sulfonyl group or a carbonyl group;

Z represents a hydrogen atom or an alkyl group;

X represents a divalent bonding group represented by the formula $—A^1—L_n—(A^2)—_p$ wherein A^1 and A^2, which may be the same or different, each represents an alkylene group, an aralkylene group, a phenylene group or a substituted phenylene group; L represents a divalent group selected from the group consisting of an oxy group, a carbonyl group, a carboxyamido group, a carbamoyl group, a sulfonamido group, a sulfamoyl group, a sulfinyl group and a sulfonyl group, and p and n each represents 0 or 1; and

the group represented by the formula $Y—NHSO_2—$ is a redox center which functions to release a diffusible dye as a result of self cleavage due to oxidation with Y representing a carboxylic ring containing at least one unsaturated double bond and a ballast group and substituted with (a) a hydroxy group or a precursor thereof or (b) an amino group, the substitution of said hydroxy group or said amino group being at the position ortho or para to the $SO_2NH—$ group.

4,250,247

ACID DEGRADABLE RADIATION-SENSITIVE MIXTURE

Jürgen Sander, Kelkheim; Gerhard Buhr, Königstein, and Hans Ruckert, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 5, 1979, Ser. No. 54,809

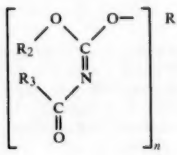
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1978, 2829512

Int. Cl.³ G03C *1/68*

U.S. Cl. 430—270 **7 Claims**

1. In a radiation-sensitive mixture containing (a) a compound which forms an acid under the influence of actinic radiation and (b) a compound which has at least one acid-cleavable bond and the solubility of which in a liquid developer is increased by the action of an acid,

the improvement that compound (b) corresponds to the general formula I



(I)

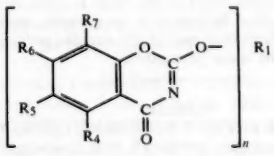
wherein

R_1 is an n-valent aliphatic, cycloaliphatic or aromatic group,

R_2 and R_3 are alkyl or aryl groups, and any two of the groups R_1, R_2, and R_3 may be linked to form a heterocyclic ring, and

n is an integer from 1 to 3,

or to the formula II



(II)

wherein

R_4, R_5, R_6, & R_7 are hydrogen atoms or halogen atoms, alkyl, alkoxy, aryl, aryloxy, acyl, acyloxy, carbalkoxy or nitro groups, and any two of the groups R_4 to R_7 may be linked to form a ring, and

R_1 and n have the meanings stated above.

4,250,248
PHOTOPOLYMERIZABLE MIXTURE CONTAINING UNSATURATED POLYURETHANE

Raimund J. Faust, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

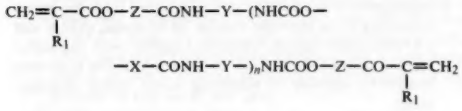
Filed May 23, 1979, Ser. No. 41,741

Claims priority, application Fed. Rep. of Germany, May 20, 1978, 2822190

Int. Cl.[3] **G03C** *1/68*

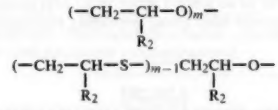
U.S. Cl. 430—284 **11 Claims**

1. A photopolymerizable mixture comprising a polymeric binder which is soluble or at least swellable in aqueous-alkaline solutions, a photoinitiator, and a polyurethane with two terminal acrylic acid or methacrylic acid ester groups which is capable of addition polymerization, and corresponds to the following general formula I



wherein

—X—is one of the groups

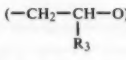


$-C_kH_{2k}-O-$ and

$-C_rH_{2r-2}-O-$,

Y is a saturated aliphatic or cycloaliphatic group with 2 to 12 carbon atoms, and

Z is



and wherein

R_1, R_2, and R_3 are hydrogen atoms or methyl groups,

n is a whole number from 2 to 15,

m is a whole number from 2 to 4,

p is a whole number from 1 to 4,

k is a whole number from 2 to 12, and

r is a whole number from 4 to 12.

4,250,249
METHOD FOR DEVELOPING RESIDUAL-MOISTURE PHOTOGRAPHS

Bernhard Montag, Kersbach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 25, 1978, Ser. No. 936,948

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1977, 2741405

Int. Cl.[3] **G03C** *5/30;* **G01M** *9/00*

U.S. Cl. 430—355 **6 Claims**

1. A method for developing residual-moisture photographs according to the wet-film technique, comprising:

(a) flowing a gas against a photographic film which has been swelled in water and exposed thereby generating a residual-moisture profile on the photographic film;

(b) contacting said film on which said residual-moisture profile has been generated with a 5% ethanolic sodium hydroxide solution having a temperature of about 10 to 16° C.;

(c) thereafter contacting said film with a photographic developer solution having a temperature of about 50° C.; and

(d) further processing said film to fix, rinse and dry the photographic half-tone image obtained upon development.

4,250,250
PHOTOGRAPHIC PROCESS

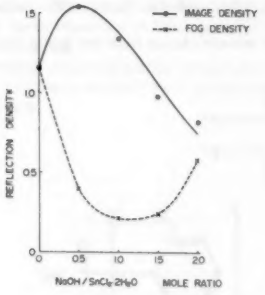
Nobuhiro Miyakawa, Kobe; Hiroshi Kokado, and Eiichi Inoue, both of Tokyo, all of Japan, assignors to Mita Industrial Company Limited, Osaka, Japan

Continuation of Ser. No. 866,342, Jan. 3, 1978, abandoned, which is a continuation of Ser. No. 724,230, Sep. 17, 1976, abandoned. This application Aug. 10, 1979, Ser. No. 65,740

Claims priority, application Japan, Sep. 22, 1975, 50-113675

Int. Cl.[3] **G03C** *5/24*

U.S. Cl. 430—374 **16 Claims**



1. A photographic process comprising exposing a photosensitive layer comprising particles of a divalent tin basic salt dispersed in a high-molecular-weight binder to actinic rays having a wave length in the range of 260 to 450 mμ to form a pattern consisting of nonreducing exposed areas and reducing nonexposed areas, said particles of the divalent tin basic salt being obtained by reacting an aqueous solution of a water-soluble tin (II) salt with an alkaline agent in an amount of 0.4 to 0.8 equivalent to partially hydrolyze said water-soluble tin salt, said divalent tin basic salt having a sensitivity only to rays having a wave length in the range of 260 to 450 mμ, said high molecular weight binder being present in an amount of 5 to 40 parts by weight per 100 parts by weight of the divalent tin basic salt, and developing the exposed photosensitive layer by contacting said layer with a developer capable of forming or erasing color by reduction to thereby form a visible image corresponding to said non-exposed area or said exposed area, said developer being selected from the group consisting of

(A) water-soluble salts containing a reducing metal ion,

(B) molybdic acid, phosphomolybdic acid, silicomolybdic acid and water-soluble salts thereof,

(C) combinations of alkali ferricyanides with water-soluble ferric salts,

(D) brucine, cacotheline, and

(E) oxidative reducing dyes.

4,250,251

PHENYLSULFAMOYL COUPLERS, COUPLER COMPOSITIONS AND PHOTOGRAPHIC ELEMENTS SUITED TO FORMING INTEGRAL SOUND TRACKS

Harland J. Osborn, Rochester; Robert G. Cameron, Spencerport, and Edward J. Walsh, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

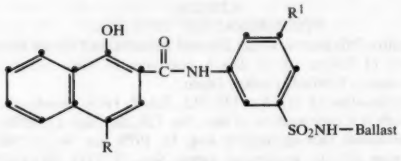
Continuation-in-part of Ser. No. 928,741, Jul. 27, 1978, abandoned. This application Jul. 11, 1979, Ser. No. 56,587

Int. Cl.³ G03C *1/40*

U.S. Cl. 430—449 **21 Claims**

17. A composition which can be coated to form a layer of a photographic element comprising a hydrophilic colloid and coupler solvent particles dispersed therein in a photographically useful amount comprised of a combination, capable of permitting the formation of a microcrysalline dye, of

a coupler of the formula



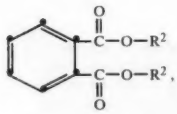
wherein

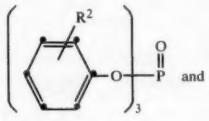
R is a coupling-off group,

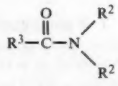
R^1 is either hydrogen or —SO_2NH—Ballast and

Ballast is a hydrophobic photographic ballasting group and

a coupler solvent chosen from the group consisting of







wherein

R^2 is hydrogen or lower alkyl of from 1 to 6 carbon atoms and is lower alkyl in at least one occurrence, and

R^3 is a straight-chain alkyl group of from 7 to 15 carbon atoms;

said coupler and said coupler solvent being present in a weight ratio in the range of from 5:1 to 1:2.

4,250,252

LIGHT-SENSITIVE COLOR PHOTOGRAPHIC MATERIAL

Heinrich Odenwälder; Hans Vetter, both of Cologne; Walter Püschel, and Erwin Ranz, both of Leverkusen, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

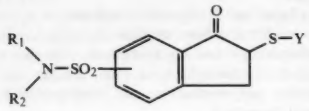
Filed Oct. 3, 1975, Ser. No. 619,301

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1974, 2448063

Int. Cl.³ G03C *1/76*

U.S. Cl. 430—505 **5 Claims**

1. In a color photographic material containing in at least one of its lightsensitive silver halide emulsion layers or a non lightsensitive binder layer associated with one of said lightsensitive silver halide emulsion layers, a non-diffusing thioether compound capable of releasing on reaction with the oxidation product of a color developer compound a diffusing mercapto compound which inhibits the further development of the silver halide, wherein the improvement comprises the thioether compound corresponds to the following formula



(I)

wherein

Y represents a non-coupling radical selected from the group consisting of an aliphatic radical, an aromatic radical and a heterocyclic radical, splittable together with the sulfur atom of the thioether bridge to form a diffusible mercapto compound capable of inhibiting silver halide development,

R_1 represents hydrogen or an alkyl group having 1–3 carbon atoms, and

R_2 represents an alkyl group having up to 22 carbon atoms including a photographic inert group providing resistance to diffusion, or an aralkyl group or an aryl group carrying a photographic inert group providing resistance to diffusion.

4,250,253

COMPOSITION ADAPTED FOR THE DETERMINATION OF TRI-IODO THYRONINE AND DIAGNOSIS METHOD EMPLOYING SAME

Pierluigi Renzi, and Vittorio Baroncelli, both of Rome, Italy, assignors to Snamprogetti S.p.A., Milan, Italy

Filed Mar. 9, 1978, Ser. No. 884,811

Claims priority, application Italy, Mar. 15, 1977, 21231 A/77

Int. Cl.³ C12Q *1/66;* **C12N** *9/96*

U.S. Cl. 435—7 **1 Claim**

1. A method for the determination of the concentration of tri-iodo thyronine said method comprising:

(a) extracting the tri-iodo thyronine of the sample being assayed by means of an insolubilized anti-T_3 antibody derived from serum and tri-iodo thyronine;

(b) contacting the extracted tri-iodo thyronine in a column with a sensibilized enzyme that is an enzyme that is covalently with tri-iodo thyronine and is derived from carbonic anhydrase and tri-iodo thyronine;

(c) hydrolyzing the effluent from the column with p-nitrophenylacetate; and

(d) spectrophotometrically determining the concentration of tri-iodo thyronine by measuring the absorption of p-nitrophenylacetate hydrolyzed washings from said column in comparison with a standard.

4,250,254

STABILIZED LIQUID ENZYME AND COENZYME COMPOSITIONS

Ivan E. Modrovich, 1043 Mesa Dr., Camarillo, Calif. 93010

Continuation of Ser. No. 722,565, Sep. 13, 1976, abandoned. This application Sep. 11, 1978, Ser. No. 940,941

Int. Cl.³ C12Q *1/54, 1/50;* **C12N** *9/96*

U.S. Cl. 435—14 **67 Claims**

1. A stabilized liquid enzyme and coenzyme composition used in biological diagnostic determinations and which enzyme and coenzyme cooperate to affect the reactivity of a biological constituent in a biological diagnostic determination, said enzyme and coenzyme being normally unstable in an aqueous media, said composition comprising:

(a) at least 30% v/v of an aqueous vehicle,
(b) at least a sufficient amount of coenzyme to cooperate in a biological diagnostic determination with said enzyme to perform said determination and which coenyme is dissolved in said aqueous vehicle,
(c) at least 100 I.U. of enzyme dissolved in said aqueous vehicle and being primarily effective in affecting reactivity of said biological constituent and both said enzyme and coenzyme cooperating in a determination reaction,
(d) a non-reactive aqueous miscible polyol organic solvent present in an amount of about 5% v/v to about 25% V/V in said aqueous vehicle and which solvent is liquid at least at room temperature and dissolved in said aqueous vehicle, the organic solvent being essentially non-degradatively reactive with the enzyme and coenzyme, and where activity of the enzyme and the coenzyme remains substantially unaffected by the presence of the organic solvent in the stabilized composition and in a determination reaction,
(e) and said composition having a pH from about 6.0 to about 8.5, such that the enzyme and coenzyme are stabilized, said composition being stabilized for a substantial period of time without significant degradation of the enzyme or the coenzyme, and
(f) said enzyme being selected from the class consisting of glucose-6-phosphate dehydrogenase, hexokinase, glutamate dehydrogenase, creatine phosphokinase, pyruvate kinase and alkali phosphatase, and said coenzyme being selected from the class consisting of nicotinamide-adenine dinucleotide, adenosine triphosphate, adenosine-5'-diphosphate, nicotinamide-adenine dinucleotide phosphate, and adenosine monophosphate.

4,250,255

ASSAY METHOD FOR ISOENZYME ACTIVITY

Karl J. Sanford, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 11, 1977, Ser. No. 814,770
Int. Cl.[3] C12Q *1/48, 1/42, 1/32*
U.S. Cl. 435—15 **11 Claims**

1. A method for determining the activity of an isoenzyme in a sample, said method comprising:
performing a first assay to determine total enzyme activity in the sample;
performing a second assay in the presence of a predetermined concentration of an ionic amphiphile having a hydrophilic and a hydrophobic portion that specifically inhibits said isoenzyme; and
determining the activity of said isoenzyme present in the sample, using the difference between the first and second assays.

4,250,256

MICROBIOLOGICAL TEST DEVICE

Hans Wielinger; Walter Rittersdorf; Manfred Bleisteiner, all of Mannheim; Gerd Zimmermann, Weinheim; Wolfgang Werner, and Wolfgang Vömel, both of Mannheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Jun. 1, 1979, Ser. No. 44,629
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1978, 2825636
Int. Cl.[3] C12Q *1/18*
U.S. Cl. 435—32 **25 Claims**

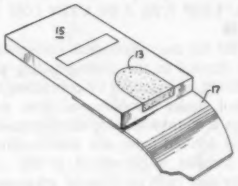
1. Microbiological test device comprising a nutrient card and a covering layer which is impermeable to bacteria but permeable to nutrients, said covering layer comprising a water-insoluble synthetic resin film modified with a pore former which is a water-soluble or water-swellable compound, said film having been produced from an aqueous dispersion of the synthetic resin and wherein the pore former and resin film have no negative effect on bacterial growth.

4,250,257

WHOLE BLOOD ANALYSES IN POROUS MEDIA

Martin J. Lee, Leonia, and Michael J. Malin, Park Ridge, both of N.J., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Aug. 24, 1978, Ser. No. 936,436
Int. Cl.[3] C12M *1/34;* **G01N** *21/27, 31/06, 33/52*
U.S. Cl. 435—4 **38 Claims**



1. A method of determining the concentration of particulate in a solution, comprising the steps of:
(a) contacting a surface of a medium containing an inert substance with a solution containing particulate, said inert substance being inert with respect to said solution and said particulate;
(b) diffusing at least a portion of said solution across said surface into said medium;
(c) diffusing at least a portion of said inert substance from within said medium across the surface contacted by said solution, the diffusion of said inert substance from the medium being indicative of the amount of particulate in said solution; and
(d) determining the concentration of said particulate in said solution as a function of said inert substance diffusing from said medium.

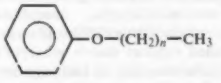
4,250,258

USE OF PHENOXYALKANES AS PRECURSORS IN PENICILLIN V FERMENTATION

Laszlo J. Szarka, East Brunswick, and Robert W. Eltz, Princeton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Dec. 20, 1979, Ser. No. 105,801
Int. Cl.[3] C12P *37/04*
U.S. Cl. 435—45 **8 Claims**

1. The fermentative method of producing Penicillin V which comprises aerobically culturing a penicillin-producing microorganism in a medium containing a source of nitrogen, a source of carbon and energy, inorganic salts, and as the sidechain precursor one or more phenoxyalkanes of the formula



wherein n is an integer from 6 to 13, said fermentation process being performed without the addition of phenoxyacetic or its salts to said medium, followed by the step of recovering the Penicillin V from said medium.

4,250,259

MICROBIOLOGICAL PRODUCTION OF KETONES FROM C_3-C_6 SECONDARY ALCOHOLS

Ching-Tsang Hou; Ramesh N. Patel, both of Edison, N.J., and Allen I. Laskin, New York, N.Y., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 896,475, Apr. 14, 1978, abandoned, and Ser. No. 896,476, Apr. 14, 1978, abandoned. This application Mar. 30, 1979, Ser. No. 25,727

Int. Cl.[3] **C12P** *7/26, 7/04;* **C12N** *1/30, 9/02*

U.S. Cl. 435—148 **29 Claims**

1. A process for the microbiological conversion of a C_3-C_6 liner secondary alcohol to the corresponding methyl ketone comprising oxidizing said alcohol by contacting a C_3-C_6 linear secondary alcohol, under aerobic conditions, with microbial cell derived from a methylotrophic microorganism or an enzyme preparation derived from said microorganism, wherein said secondary alcohol is converted to the corresponding methyl ketone by said cells or enzyme preparation, wherein said microorganism has been previously grown under aerobic conditions in a nutrient medium containing a carbon-containing compound which provides the carbon and energy source for growth of the cells of the microorganism and induces C_3-C_6 secondary alcohol dehydrogenase enzyme activity in said cells and wherein said methyl ketone is produced in insolable amounts.

4,250,260

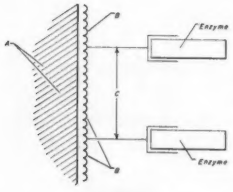
REGENERATION OF AN IMMOBILIZED ENZYME SYSTEM

Ronald P. Rohrbach, Forest Lake, Ill., and Joseph Levy, Deerfield Beach, Fla., assignors to UOP Inc., Des Plaines, Ill.

Filed Aug. 22, 1979, Ser. No. 68,803

Int. Cl.[3] **C12M** *11/14, 11/08, 11/06;* **B01J** *31/40*

U.S. Cl. 435—176 **7 Claims**



1. A method for regenerating a used organic-inorganic support matrix comprising an organic polymeric material having functionalized pendant groups coupled with immobilized enzymes which method comprises:

(a) treating said used support matrix with a stripping agent consisting essentially of a strong acid at stripping conditions which include a temperature of from about 20° to about 75° C.;

(b) washing said treated support matrix containing immobilized enzymes and said strong acid to remove said strong acid from said treated support matrix;

(c) treating said washed support matrix of step (b) with a bifunctional organic molecule consisting essentially of a compound selected from the group consisting of glutaraldehyde, succindialdehyde, terephthaladehyde and toluenediiscocyanate to attach pendant organic molecules to said washed support matrix wherein said pendant organic molecules attached to said support matrix are sufficient to replace former pendant organic molecules removed through said use of said support matrix;

(d) washing said support matrix containing newly attached pendant organic molecules to remove excess organic molecules from said treatment of step (c); and

(e) immobilizing fresh active enzymes by coupling said enzymes to said newly attached pendant organic molecules.

4,250,261

PROCESS FOR THE MICROBIAL PRODUCTION OF ALCOHOLOXIDASE

Lothar Eggeling; Manfred Paschke, and Hermann Sahm, all of Jülich, Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft m.b.H., Jülich, Fed. Rep. of Germany

Filed Jul. 9, 1979, Ser. No. 55,533

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1978, 2830327

Int. Cl.[3] **C12N** *9/04*

U.S. Cl. 435—190 **5 Claims**

1. A method of producing alcohol oxidase which comprises the steps of:

cultivating *Hansenula polymorpha* yeast in a nutrient broth containing inorganic nutruents, methanol serving as a carbon and energy source, and vitamins in a composition suitable to the production of alcohol oxidase at a temperature of 25° C. to 45° C. and at a pH of 4.0 to 6.0 and with the supply of oxygen to the broth to produce a cell mass;

adding to the broth during the cultivation thereof an organic substrate noncatabolite-repressive to alcohol oxidase in the form of at least one compound selected from the group which consists of glycerin, sorbite and xylose and in a concentration of 0.1 to 1.0% in a nutrient solution at a rate of 0.03 to 0.15 h^{-1}; and

recovering alcohol oxidase from the cell mass.

4,250,262

METHOD OF PREPARING A PURIFIED GLUCOSYLTRANSFERASE

Martin A. Taubman, Newton, and Daniel J. Smith, Natick, both of Mass., assignors to Forsyth Dental Infirmary for Children, Boston, Mass.

Continuation of Ser. No. 956,847, Nov. 2, 1978, abandoned, which is a division of Ser. No. 879,432, Feb. 21, 1978, Pat. No. 4,150,116. This application Dec. 14, 1979, Ser. No. 103,590

Int. Cl.[3] **C12N** *9/10*

U.S. Cl. 435—193 **13 Claims**

1. In a method of recovering glucosyltransferase (GTF) for use in immunization against dental caries, which method comprises:

(a) culturing *Streptococcus mutans* in a medium containing glucose and essentially dialyzable nutrients to form a mixture of culture cells and supernatant;

(b) removing the cells for the culture supernatant;

(c) incubating the recovered supernatant with a polysaccharide to synthesize water-insoluble polysaccharide;

(d) recovering the water-insoluble polysaccharide;

(e) washing the polysaccharide to remove water-soluble contaminants; and

(f) recovering the GTF from the water-insoluble polysaccharide, the improvement which comprises

(i) incubating the washed water-insoluble polysaccharide from the supernatant with a denaturing solvent to break the bond between the water-insoluble polysaccharide and the GTF enzyme,

(ii) separating the water-insoluble polysaccharide from the denaturing solvent containing the GTF enzyme,

(iii) separating the denaturing solvent from the GTF in the supernatant, and

(iv) concentrating the GTF enzyme to provide a concentrated GTF consisting of essentially purified GTF suitable for use for preventing dental caries.

4,250,263

METHOD OF PURIFICATION OF THERMALLY STABLE ENZYMES

Vida Winans, Downers Grove, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Nov. 13, 1979, Ser. No. 93,568
Int. Cl.[3] C12N 9/92
U.S. Cl. 435—234 6 Claims

1. A method of purifying glucose isomerase which consists of heating a glucose isomerase-containing solution at a temperature of from about 40° C. to about 80° C. for a time period of from about 5 to about 120 minutes to precipitate solid matter, separating the precipitated solid matter from the solution, and recovering the thus purified glucose isomerase solution.

4,250,264

GROWTH LIMITING MEDIA

Robert L. Nelson, and James F. Drake, both of Minneapolis, Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 808,458, Jun. 21, 1977, abandoned.
This application May 21, 1979, Ser. No. 40,914
Int. Cl.[3] C12N 1/20
U.S. Cl. 435—253 4 Claims

1. An aqueous medium capable of growing at least one species from at least two different genera of aerobic, pathogenic, rapidly growing bacteria from a beginning population to a predetermined ending population of about 6×10^7 to 3×10^8 CFU/ml at which said growth of said bacteria substantially subsides due to the lack of nutrient in said medium and wherein said bacteria remain viable for at least 18 hours, said medium comprising an aqueous solution comprising about 0.42 to about 0.70 milligrams of carbon per milliliter of medium and about 0.09 to about 0.15 milligrams of nitrogen per milliliter of medium in the form in which said nutrients are present in peptone or about 0.16 to about 0.27 milligrams of carbon per milliliter of medium and about 0.035 to about 0.056 milligrams of nitrogen per milliliter of medium in the form in which said nutrients are present in proteose peptone and vitamins and minerals of sufficient quantity to provide said growth and in a form usable by said bacteria for said growth.

4,250,265

METHOD OF OBTAINING AN ANTIGENIC FRACTION FROM *BORDETELLA BRONCHISEPTICA*

Dennis J. Carlo, Rahway; Arpi Hagopian, and Peter J. Kniskern, both of Sayreville, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 17,528, Mar. 5, 1979, Pat. No. 4,203,970.
This application Oct. 15, 1979, Ser. No. 84,973
Int. Cl.[3] C07G 7/00
U.S. Cl. 435—272 2 Claims

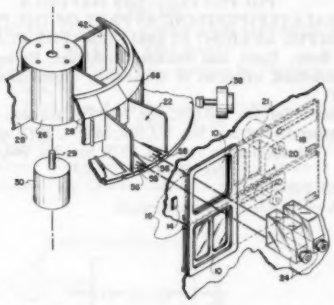
1. A method for obtaining the antigenic fraction of an immunogenic sub-cellular cell wall of *Bordetella bronchiseptica* containing in part by weight at least about 53% Lowry protein, from about 10 to about 13% carbohydrate, of which about 19% is hexose and about 19% is hexosamine, from about 1 to about 1.4% sialic acid and about 0.18% KDO, comprising extracting a cell paste of a *B. bronchiseptica* strain in an aqueous medium at a temperature from about 4° C. to about 75° C.; centrifuging the extract; digesting the supernatant fluid with RNase and DNase; and dialyzing the digested fluid to remove nucleic acid fragments and thereby obtaining the antigenic fraction.

4,250,266

AUTOMATED MICRO-ORGANISM CULTURE GROWTH AND DETECTION INSTRUMENT

Gerald J. Wade, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 19, 1979, Ser. No. 105,376
Int. Cl.[3] C12M 1/36
U.S. Cl. 435—289 16 Claims



1. Medical analyzing apparatus including a micro-organism incubator and growth detection apparatus wherein micro-organism cultures are contained in culture bottles having a pair of electrodes for sensing the electrical characteristic of the culture as a function of micro-organism growth, said apparatus comprising in combination:

means defining an incubation chamber;

a plurality of carousel trays each providing receptacles for a plurality of the aforesaid micro-organism culture bottles, said carousel trays including electrical contact means for contacting the electrodes of each culture bottle positioned in said receptacles; said electrical contact means exerting a spring force to retain said bottle in said receptacles;

driving means operable to impart an oscillatory motion to said carousel trays whereby to agitate the contents of said culture bottles in said incubation chamber;

a plurality of selectively operable doors providing access to said incubation chamber, said doors corresponding in number to said plurality of carousel trays and positioned, respectively, to access the receptacles of an associated tray, said driving means being further operable to selectively index said trays to present a selected receptacle for access at its associated door; and

a micro-computer means connected to control said driving means and said doors, said micro-computer also being connected to periodically sample the electrical characteristics of said culture bottles in said incubator chamber, whereby to detect growth of micro-organisms in said bottles as a function of changes in said electrical characteristic.

4,250,267

IMMOBILIZED BIOLOGICAL MATERIAL

Frank J. Hartdegen, Columbia, and Wayne E. Swann, Pasadena, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 644,025, Dec. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 585,674, Jun. 10, 1975, abandoned. This application Nov. 10, 1977, Ser. No. 850,430
The portion of the term of this patent subsequent to Jul. 24, 1995, has been disclaimed.
Int. Cl.[3] C12N 1/00, 11/04
U.S. Cl. 435—317 5 Claims

1. A process for immobilizing an antibiotic having at least one primary or secondary amino group per molecule, the process comprising:

A. contacting the antibiotic and an excess of an isocyanate-capped liquid polyurethane prepolymer in the absence of water to form a resulting mixture; said prepolymer being

the reaction product of a polyether polyol with sufficient polyisocyanate to provide at least two free NCO groups per molecule of the prepolymer; and

B. curing the resulting mixture under nonfoaming conditions by contacting it with an amount of a curing agent effective for immobilizing said antibiotic in reusable form.

4,250,268

POLYSILYLESTERS HAVING A POLYALKYLPIPERIDINE AS PART OF THE POLYMER USEFUL AS LIGHT STABILIZERS FOR PLASTICS

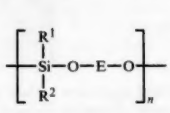
Jean Rody, Basel, and Michael Rasberger, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 896,676, Apr. 14, 1978, abandoned, which is a continuation of Ser. No. 793,708, May 4, 1977, abandoned. This application Nov. 28, 1978, Ser. No. 964,443

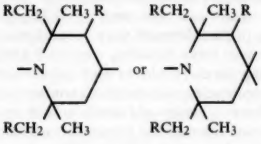
Int. Cl.³ C08G *77/26*

U.S. Cl. 525—100 **14 Claims**

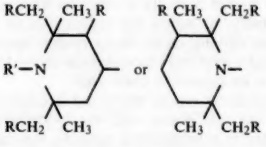
1. A polysilylester of the formula



wherein n denotes a value of from 2 to about 50, E represents a divalent organic radical which contains a polyalkylpiperidine radical of the formula



or is substituted by a polyalkylpiperidine side group of the formula



in which R denotes hydrogen or alkyl with 1–5 C atoms and R′ denotes hydrogen, alkyl with 1–12 C atoms, alkenyl with 3–8 C atoms, alkinyl with 3–6 C atoms, aralkyl with 7–12 C atoms, alkanoyl with 1–8 C atoms or alkenoyl with 3–5 C atoms and R^1 and R^2 represent methyl, ethyl or phenyl, or a copolymer thereof with a polyalkylpiperidine-free component.

4,250,269

WATER-SOLUBLE MIXTURES OF QUATERNARY AMMONIUM POLYMERS, NONIONIC AND/OR CATIONIC VINYL-ADDITION POLYMERS, AND NONIONIC AND/OR CATIONIC SURFACTANTS

Robert H. Buckman; Philip M. Hoekstra, and John D. Pera, all of Memphis, Tenn., assignors to Buckman Laboratories, Inc., Memphis, Tenn.

Filed Nov. 26, 1979, Ser. No. 97,479

Int. Cl.³ C08K *5/06, 5/19*

U.S. Cl. 525—6 **14 Claims**

1. A composition of matter comprising in admixture about 1 to about 10 parts of a quaternary ammonium polymer selected from the group consisting of an amine-epichlorohydrin condensation polymer and an ionene polymer, about 0.5 to about 7 parts of a vinyl-addition polymer selected from the group consisting of nonionic and cationic vinyl-addition polymers, and about 0.1 to about 5 parts of a surfactant selected from the group consisting of nonionic and cationic surfactants.

4,250,270

SOLUTION POLYMERIZATION WITH MOLECULAR SIEVE PURIFICATION OF RECYCLED SOLVENT

Ralph C. Farrar, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 4, 1979, Ser. No. 81,949

Int. Cl.³ C08F *2/06*

U.S. Cl. 525—54 **20 Claims**

1. In the solution polymerization process wherein (1) monomers comprising at least one conjugated diene are polymerized in a first polymerization in a solvent in the presence of an organoalkali metal initiator followed by coupling with a polyfunctional coupling agent which results in some alkyl chloride formation, and (2) solvent is recovered from said first polymerization and used in a subsequent solution polymerization process wherein monomers selected from the group consisting of conjugated dienes and vinyl-substituted aromatic compounds are polymerized in the presence of an organoalkali metal initiator, the improvement comprising contacting said solvent from said first polymerization with a molecular sieve to remove alkyl chloride therefrom before said solvent is used in said subsequent solution polymerization process.

4,250,271

ABS-TYPE POLYBLEND COMPOSITIONS

Jeff Morris, Big Spring, Tex.; Jacqueline Brandli; Emmanuel Lanza, both of Brussels, Belgium, and Willy F. R. Lingier, Beersel, Belgium, assignors to Cosden Technology, Inc., Big Spring, Tex.

Filed May 15, 1979, Ser. No. 39,106

Int. Cl.³ C08L *51/04*

U.S. Cl. 525—66 **23 Claims**

1. An ABS-type polyblend composition, having improved physical properties, comprising:

(a) from about 5 to 60% by weight of said polyblend of a copolymer A, said copolymer A comprising by weight from about 15 to 40% acrylonitrile, and from about 60 to 85% styrene;

(b) from about 95 to 40% by weight of a mixture comprising:

(i) from about 75 to 40% by weight of a graft copolymer B comprising styrene, acrylonitrile and a butadiene polymer, said copolymer B comprising by weight from about 4 to 10% butadiene, having an average particle size of from about 1 to 10 microns;

(ii) from about 25—60% by weight of a backbone copolymer C comprising styrene, acrylonitrile and a butadiene rubber having an average particle size of less than about 0.5 microns;

the ratio of copolymer B and backbone copolymer C being adjusted such that from about 5 to 40% by weight of the total butadiene polymer content of said polyblend is provided by said copolymer B.

4,250,272

ADHESIVE COMPOSITIONS

Earle E. Ewins, Jr., Houston, Tex., and Jr., deceased Cocker, late of Houston, Tex. (by F. Ramona Coker, Legal representative), assignors to Shell Oil Company, Houston, Tex.

Filed May 11, 1979, Ser. No. 38,036

Int. Cl.³ C08L *53/02*

U.S. Cl. 525—89 **4 Claims**

1. An adhesive composition comprising 100 parts by weight of a block copolymer component and 20 to 300 parts by weight of a tackifying resin component wherein:

(a) said block copolymer component comprises a mixture of

a linear or radial ABA type block copolymer and an AB two block copolymer where the A blocks are polystyrene blocks and the B blocks are polybutadiene or polyisoprene blocks; and

(b) said tackifying resin component has a softening point of 70° to 100° C., a number average molecular weight of 1,000 to 1,600, and comprises from about 80 to 91 percent by weight units derived from piperylene, from about 1 to about 8 percent by weight units derived from isobutylene and from about 8 to about 12 percent by weight units derived from alphamethyl styrene.

4,250,273

THERMOPLASTIC ELASTOMER BLENDS

Georg G. A. Bohm, Akron; Gary R. Hamed, Uniontown, and Lee E. Vescelius, Akron, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 879,308, Feb. 21, 1978, abandoned, which is a division of Ser. No. 806,036, Jun. 13, 1977, abandoned. This application Jan. 8, 1979, Ser. No. 1,623

Int. Cl.³ C08L *53/00*

U.S. Cl. 525—99 **6 Claims**

1. A thermoplastic elastomer composition comprising, a blend of

from about 10 to about 50 parts by weight of a crystalline 1-olefin polymer, said 1-olefin polymer selected from the class consisting of a homopolymer or a copolymer made from 1-olefin monomers having from 2 to 20 carbon atoms, said homopolymer or said copolymer having a melting point of at least 90° C.;

from about 80 to about 15 parts by weight of a random styrene-butadiene rubber copolymer; and

from about 5 to about 55 parts by weight of a highly saturated elastomer, said highly saturated elastomer selected from the class consisting of a hydrogenated polymer diene having from 4 to 10 carbon atoms, and a hydrogenated diblock or triblock copolymer made from conjugated dienes having from 4 to 10 carbon atoms and vinyl substituted aromatics having from 8 to 12 carbon atoms,

the amount of said saturation of said saturated elastomer being at least 70 percent,

said blend forming a thermoplastic elastomer.

4,250,274

LOW TEMPERATURE ACTIVATING ADHESIVES FOR LAMINATING PLASTIC FILMS TO METAL

Dennis J. Damico, and Vincent J. Pascarella, both of Erie, Pa., assignors to Lord Corporation, Erie, Pa.

Filed Jun. 19, 1979, Ser. No. 50,070

Int. Cl.³ C08L *75/06*

U.S. Cl. 525—127 **16 Claims**

1. An adhesive composition comprising in solution in an organic solvent:

(I) a phenolic resol resin having a methylol content of at least about 15% by weight thereof;

(II) a curable thermoplastic polyesterurethane substantially free of reactive isocyanate and hydroxyl groups and comprising a macropolyolpolyisocyanate reaction product, said macropolyol being selected from the group consisting of:

(A) polycaprolactone; and

(B) dihydroxypolyesters comprising the reaction product of:

(a) a diol selected from the group consisting of dihydroxy monomers and dihydroxypolyesters; with

(b) a polycarboxylic acid component containing about 30 to 100 mol % of an aromatic polycarboxylic acid or anhydride thereof and about 70 to 0 mol % of an aliphatic polycarboxylic acid or anhydride thereof; said polyesterurethane being chain-extended to a molecular weight of at least about 20,000 with a low molecular weight diol chain-extending agent, with the proviso that when the macroglycol is polycaprolcatone the chain-extending agent be a cycloaliphatic glycol; and

(III) a terpolymer of vinyl chloride, vinyl acetate and maleic anhydride containing at least 1% by weight of the latter;

said adhesive composition containing about 15 to 30% (I) about 25 to 40% (II) and about 35 to 55% (III) solids by weight of the total solids content.

4,250,275

REINFORCED ACRYLIC FIBER AND METHOD FOR MAKING THE SAME

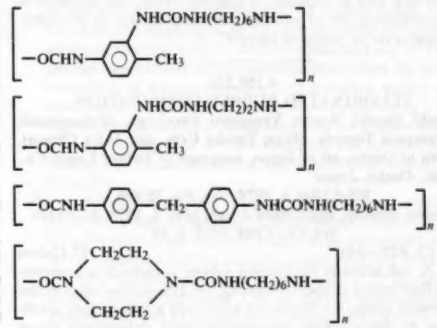
Ernest L. Lawton, Durham, N.C., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 1, 1979, Ser. No. 62,864

Int. Cl.³ C08L *75/02*

U.S. Cl. 525—128 **2 Claims**

1. An acrylic fiber containing as a discrete phase 5 to 20 weight percent of a polyurea selected from the group consisting of:



where n is 4 to 300.

4,250,276

FAST CURING COATING COMPOSITION

Lawrence G. Bockstie, Jr., Bradford, Pa., assignor to Corning Glass Works, Corning, N.Y.

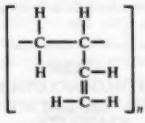
Division of Ser. No. 486,395, Jul. 8, 1974, Pat. No. 4,179,477. This application Aug. 19, 1976, Ser. No. 716,061

Int. Cl.³ C08F *279/02*

U.S. Cl. 525—263 **5 Claims**

1. An electrical component coated with a dielectric coating composition consisting essentially of

(a) from about 35 to 90 parts by weight of a polybutadiene resin system consisting essentially of 45 to 85 parts by weight of a polybutadiene resin having a molecular weight between about 750 to about 14,000, at least about 75 percent concentration of pendant vinyl groups and a molecular structure of



1 to 5 parts by weight of at least one catalyst selected from the group consisting of dicumyl peroxide, benzoyl peroxide, lauroyl peroxide, and t-butyl hydroperoxide, and up to 40 parts by weight of at least one reactive monomer selected from the group consisting of vinyl toluene, t-butylstyrene, alkyl substituted styrene and diallyl maleate, and

(b) from about 10 to 65 parts by weight of at least one silane selected from the group consisting of vinyltriethoxysilane,

vinyl silane, vinyltriacetoxysilane, and vinyltrimethoxysilane.

4,250,277

GLASS COMPOSITION FOR WATER SETTING ION-POLYMER CEMENTS

Alan Maries, London, and Francesca M. Shreeve, Harlow, both of United Kingdom, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jan. 7, 1980, Ser. No. 110,056

Int. Cl.[3] C08K *3/00*

U.S. Cl. 525—337 **9 Claims**

1. A cement composition comprising a polycarboxylic acid material and a partially or completely water soluble glass, said polycarboxylic acid material derived from unsaturated mono- or di-carboxylic acid monomer materials, said glass comprising a glass composition for effecting crosslinking of a polycarboxylic acid cement, said composition including an aluminoborate type glass comprising 40 to 75 mole % boric oxide, a 3.5 to 10 mole % alumina, 12.5 to 60 mole % zinc oxide, and 10.0 to 50 mole % calcium oxide, the raminder if any comprising one or more further metal oxides, or phosphorus pentoxide or mixtures thereof.

4,250,278

FLUORINATED RUBBER COMPOSITION

Takeshi Suzuki, Kyoto; Yasuyoshi Furukawa, Ikedaminami; Masayasu Tomoda, Shiga; Yutaka Ueta, and Akira Ohmori, both of Osaka, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed May 1, 1979, Ser. No. 35,006

Claims priority, application Japan, May 1, 1978, 53/53120

Int. Cl.[3] C08F *8/18, 8/34*

U.S. Cl. 525—340 **12 Claims**

1. A vulcanizable fluorinated rubber composition comprising a fluorinated rubber containing $—CH_2—CF_2—$ units in the polymeric chain, a vulcanizing agent and a vulcanizing accelerator as the essential components, said vulcanizing agent being a fluorine-containing polyhydroxy aliphatic compound having the formula:

$$Rf(CH_2OH)_2$$

in which Rf is a polyfluoroalkylene or polyfluorochloroalkylene group having 1 to 24 carbon atoms, said vulcanizing accelerator being an organic nitrogen-containing or phosphorus-containing compound.

4,250,279

POLYARYLATE BLENDS WITH POLYETHERIMIDES

Lloyd M. Robeson, Whitehouse Station; Markus Matzner, Edison, and Louis M. Maresca, Belle Mead, all of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 26, 1979, Ser. No. 106,504

Int. Cl.[3] C08L *67/02, 79/08*

U.S. Cl. 525—425 **20 Claims**

1. A molding composition comprising a blend of:
(a) a polyarylate derived from at least one dihydric phenol and at least one aromatic dicarboxylic acid; and
(b) a polyetherimide.

4,250,280

THERMOPLASTIC BLOCKCOPOLYETHERESTER COMPOSITION HAVING IMPROVED THERMAL STABILITY

Chiaki Tanaka, Chita; Nagayoshi Naito, and Yoko Furuta, both of Nagoya, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed May 11, 1979, Ser. No. 38,066

Claims priority, application Japan, May 26, 1978, 53/62301

Int. Cl.[3] C08L *67/00, 81/00*

U.S. Cl. 525—437 **14 Claims**

1. A thermoplastic blockcopolyetherester composition which comprises

(A) a blockcopolyetherester consisting essentially of a multiplicity of recurring intralinear long chain polyether soft segments and short chain polyester hard segments, said long chain polyether soft segments having a molecular weight of between 200 and 6,000, with and the short chain polyester units constituting about 15 to 90% by weight of the blockcopolyetherester and the long chain polyether units constituting about 85 to 10% by weight of the blockcopolyetherester, and

(B) an effective amount of polysulfide represented by the general formula

$$HS—C_2H_4—O—CH_2—O—C_2H_4—O—S—S_nC_2.$$
$$H_4—O—C_2H_4—SH$$

,

wherein n is an integer of 4 to 100.

4,250,281

MELT PROCESS FOR PREPARING COPOLYESTERS USING TRIARYLPHOSPHINE CATALYSTS

Edgar E. Riecke, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 21, 1979, Ser. No. 22,542

Int. Cl.[3] C08L *67/02;* C08G *63/04*

U.S. Cl. 525—444 **18 Claims**

1. In a melt phase process for preparing a copolyester in the presence of a catalyst by reacting a first polyester with either a second polyester or polyester precursors, the improvement wherein said catalyst is a triarylphosphine having a boiling point in the range of from about 200° to about 500° C.

4,250,282

MELAMINE RESIN, PROCESS FOR ITS MANUFACTURE AND ITS USE FOR THE MANUFACTURE OF COATED WOOD-BASED MATERIALS AND LAMINATES

Peter Dörries, Frankfurt; Steffen Piesch, Oberursel, and Alfons Wolf, Seligenstadt, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 13, 1979, Ser. No. 93,292

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1978, 2851760

Int. Cl.[3] C08G *8/28;* C08F *283/00*

U.S. Cl. 525—509 **13 Claims**

1. Melamine-formaldehyde resin comprising
(a) melamine-formaldehyde precondensation product wherein the molar ratio of melamine:formaldehyde is 1:1.4 to 1:2.6 and (b) 0.1 to 1.0% by weight, based on total solids, of an amine of the formula

wherein R^1 and R^2 are each identical or different alkyl having 1 to 4 carbon atoms and R^3 is 2-hydroxyethyl, 2-(2-hydroxyethoxy)-ethyl, 3-hydroxyl-1-propyl, 3-hydroxy-2-propyl, 2,3-dihydroxypropyl or

$$—CH_2CH_2—NR^1R^2,$$

wherein said amine may be present entirely or partially in the form of its reaction product with the melamine-formaldehyde pre-condensation product.

4,250,283

TITANIUM TRIHALIDE COMPOSITION

Anthony D. Caunt, Welwyn Garden City, England, and James F. R. Jaggard, Bad Kissingen, Fed. Rep. of Germany, assignors to Imperial Chemical Industries Limited, London, England

Filed Feb. 12, 1975, Ser. No. 549,301

Claims priority, application United Kingdom, Feb. 12, 1974, 6240/74; Nov. 18, 1974, 49734/74

Int. Cl.[3] C08F *4/66, 10/06*

U.S. Cl. 526—77 19 Claims

1. A process for the preparation of a titanium trihalide wherein a titanium tetrahalide is reacted with an organoaluminium compound to give a titanium trihalide product and this product is treated with an ether of the formula

R'—O—R''

and then at a temperature in the range from 60° C. up to 120° C. for a time of from 10 minutes up to 100 hours, with a solution, in a liquid hydrocarbon of an alkyl aluminium dihalide, the amount of the alkyl aluminium dihalide being from 0.1 up to 100 moles per mole of titanium trihalide present in the titanium trihalide product wherein R' and R'' can be the same or different and are alkyl groups containing from 4 up to 10 carbon atoms.

4,250,284

PROCESS AND CATALYST COMPONENTS FOR THE POLYMERIZATION AND THE COPOLYMERIZATION OF OLEFINS

Andre Delbouille, and Jean L. Derroitte, both of Brussels, Belgium, assignors to Solvay & Cie, Brussels, Belgium

Continuation of Ser. No. 313,946, Dec. 11, 1972, abandoned, which is a continuation of Ser. No. 889,737, Dec. 31, 1969, abandoned. This application Feb. 24, 1975, Ser. No. 552,335

Claims priority, application United Kingdom, Jan. 6, 1969, 706/69

Int. Cl.[3] C08F *4/02, 10/00*

U.S. Cl. 526—124 4 Claims

1. In a process for the polymerization or copolymerization of olefins in the presence of a catalyst consisting essentially of a trialkylaluminum and a solid catalyst component having at least at the surface thereof groups derived from the compound titanium tetrachloride, the improvement which comprises carrying out said polymerization or copolymerization in the presence of a catalyst wherein the solid catalyst component is obtained by reacting a titanium tetrachloride with a magnesium dialkoxide in the absence of solvent and at a temperature higher than ambient temperature, separating the solid component formed from the reaction medium and washing the same with an inert solvent until the solvent is free from all traces of chlorine, and wherein the trialkylaluminum compound is present in a molar excess of at least 2 with respect to the titanium metal present in the solid catalyst component.

4,250,285

PROCESS FOR POLYMERIZING OLEFINS AND CATALYSTS THEREFOR

Syuji Minami, Ohtake; Akinori Toyota, Iwakuni, and Norio Kashiwa, Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan

Continuation of Ser. No. 758,325, Jan. 10, 1977, abandoned. This application May 4, 1978, Ser. No. 902,946

Claims priority, application Japan, Jan. 19, 1976, 51/4056

Int. Cl.[3] C08F *4/02, 10/06*

U.S. Cl. 526—125 14 Claims

1. A process for preparing a polymer or copolymer of an olefin having at least 3 carbon atoms which comprises polymerizing or copolymerizing an olefin having at least 3 carbon atoms and containing 0 to 10 mole% of another olefin or diolefin in the presence of a catalyst composed of (i) a solid titanium catalyst component and (ii) an organoaluminum compound; wherein the solid titanium catalyst component is obtained by contacting in the liquid phase and in the absence of mechanical copulverization

(1) a magnesium containing copulverization product consisting essentially of:

(A) an aluminum or germanium compound selected from the group consisting of aluminum compounds of the formula AlR_nX_{3-n} wherein R is a hydrogen atom, or an alkoxy group containing 1 to 12 carbon atoms, aryl group containing 6 to 12 carbon atoms, aryloxy group containing 6 to 12 carbon atoms or acyloxy group containing 2 to 13 carbon atoms and any of these groups may include a substitutent selected from the group consisting of alkyl containing 1 to 8 carbon atoms, aryl containing 6 to 12 carbon atoms, alkoxy containing 1 to 8 carbon atoms, aryloxy containing 6 to 12 carbon atoms, acyl containing 2 to 13 carbon atoms, and acyloxy containing 2 to 13 carbon atoms, X is a halogen atom, and $0<n\leqq 3$, and germanium compounds of the formula GeR'_mX_{4-m} wherein R' is a hydrogen atom, or an alkyl group containing 1 to 8 carbon atoms, alkenyl group containing 2 to 8 carbon atoms, alkoxy group containing 1 to 12 carbon atoms, aryl group containing 6 to 12 carbon atoms, aryloxy group containing 6 to 12 carbon atoms or acyloxy group containing 2 to 13 carbon atoms and any of these groups may include a substitutent selected from the group consisting of alkyl containing 1 to 8 carbon atoms, aryl containing 6 to 12 carbon atoms, alkoxy containing 1 to 8 carbon atoms, aryloxy containing 6 to 12 carbon atoms, acyl containing 2 to 13 carbon atoms, and acyloxy containing 2 to 13 carbon atoms, and X is defined above, and $0\leqq m\leqq 4$;

(B) a halogen-containing magnesium compound selected from the group consisting of magnesium dihalide and a halogen-containing organic magnesium compound containing halogen and an organic group selected from the group consisting of alkoxy groups with 1 to 12 carbon atoms, alkyl groups with 1 to 12 carbon atoms, acyloxy groups with 2 to 13 carbon atoms and aryloxy groups with 6 to 8 carbon atoms, and;

(C) an organic ester formed between a carboxylic acid or halocarboxylic acid selected from the group consisting of unsaturated aliphatic carboxylic acids containing 1 to 8 carbon atoms, halogen-substituted derivatives thereof, and aromatic carboxylic acids containing 7 to 14 carbon atoms, and an alcohol or phenol selected from the group consisting of saturated or unsaturated aliphatic primary alcohols containing 1 to 8 carbon atoms, saturated or unsaturated alicyclic alcohols containing 3 to 8 carbon atoms, saturated or unsaturated aliphatic primary alcohols containing 1 to 4 carbon atoms bonded to an alicyclic or aromatic ring with 3 to 10 carbon atoms, and phenols containing 6 to 10 carbon atoms, the compounds (A) and (B), or the compounds (A), (B) and (C) being mechanically copulverized, the amount of compound (A) being about 0.001 to about 10 moles per mole of compound (B), and the amount of compound (C) being about 0.005 to about 10 moles per mole of the compound (B), with;

(2) a titanium compound (D) of the formula $Ti(OR)_gX_{4-g}$ wherein R is an alkyl group, X is a halogen atom, and $0\leqq g\leqq 4$, the Ti/Mg atomic ratio of the solid titanium catalyst component being about $\frac{1}{4}$ to about 1/16 and the halogen/Ti atomic ratio being about 5 to about 40.

4,250,286

ULTRA HIGH EFFICIENCY CATALYST FOR POLYMERIZING OLEFINS

Randall S. Shipley, Alvin, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 28, 1979, Ser. No. 79,919

Int. Cl.[3] C08F *4/02, 10/02*

U.S. Cl. 526—125 6 Claims

1. A process for polymerizing one or more α-olefins which comprises conducting the polymerization under Ziegler poly-

merization conditions in the presence of a catalyst composition containing:

the catalyst reaction product of

(A) the reaction product or complex formed from the admixture of

(1) at least one transition metal compound represented by the formulae $Tm(OR)_yX_{x-y}$ or $Tm(OR)_{x-2}O$ wherein Tm is a transition metal selected from groups IVB, VB or VIB; each R is independently a hydrocarbyl group, having from 1 to about 20 carbon atoms; each X is independently a halogen; x has a value equal to the valence of Tm and y has a value from 1 to the valance of Tm; and

(2) at least one zinc compound represented by the formulae R_2Zn and RZnX wherein each R is independently a hydrocarbyl group having from 1 to about 20 carbon atoms and X is a halogen; and

(B) a magnesium halide resulting from the reaction of

(1) an organomagnesium compound represented by the formulae $MgR''_{2-x}MR''_y$ wherein M is aluminum or zinc, each R'' is independently a hydrocarbyl or hydrocarbyloxy group having from 1 to about 20 carbon atoms, x has a value from zero to 10 and y has a value corresponding to the valence of M; with

(2) a halide source selected from

(a) an active non-metallic halide, said non-metallic halide corresponding to the formula R'X wherein R' is hydrogen or a hydrocarbyl group such that the hydrocarbyl halide is at least as active as sec-butyl chloride and does not poison the catalyst and X is halogen or

(b) a metallic halide corresponding to the formula $MR_{y-a}X_a$ wherein M is a metal of Group IIB, IIIA or IVA of Mendeleev's Periodic Table of Elements, R is a monovalent hydrocarbyl radical, X is halogen, y is a number corresponding to the valence of M and a is a number of 1 to y; and

(C) when the organomagnesium component and/or the halide source provides insufficient quantities of aluminum, an aluminum compound represented by the formula $AlR_{y'}X_{y''}$ wherein R and X are as defined above and y' and y'' each have a value of from zero to three with the sum of y' and y'' being three; and

wherein the components are employed in quantities which provide at atomic ratio of the elements Mg:Tm of from about 1:1 to about 200:1; Zn:Tm at least about 0.03:1; Al:Tm of from about 0.1:1 to about 200:1 and an excess X:Al of from about 0.005:1 to about 10:1.

4,250,287

1-OLEFIN POLYMERIZATION CATALYST

Albert S. Matlack, Hockessin, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 110,563, Jan. 9, 1980. This application Mar. 14, 1980, Ser. No. 130,500

Int. Cl.³ C08F *4/02, 10/00*

U.S. Cl. 526—125 **4 Claims**

1. In a process for the polymerization of 1-olefins in the presence of a solid catalyst component composed of a titanium halide deposited on an anhydrous, essentially magnesium halide support and an activator component composed of a trialkylaluminum and an alkyl ester of an aromatic carboxylic acid, said ester containing from eight to twenty-six carbon atoms, the improvement which comprises including a halosilane in the activator component, said halosilane having the formula $ASiHX_2$, wherein A is a hydrogen atom, a lower alkyl group or X, and X is a chlorine or bromine atom, the amount of said halosilane being sufficient to provide a mole ratio of silicon to aluminum of from about 0.3:1 to about 10:1.

4,250,288

HIGH EFFICIENCY, HIGH TEMPERATURE CATALYST FOR POLYMERIZING OLEFINS

Kirby Lowery, Jr.; George W. Knight, and James A. May, Jr., all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 581,294, May 27, 1975, abandoned. This application Feb. 3, 1977, Ser. No. 765,182

Int. Cl.³ C08F *4/66, 10/02*

U.S. Cl. 526—137 **9 Claims**

1. A process for the polymerization of an α-olefin under conditions characteristic of Ziegler polymerization in the presence of a catalytic amount of a catalytic reaction product of (A) compound of a transition metal (TM), (B) an organomagnesium component selected from (1) an organomagnesium compound or (2) a complex of an organomagnesium compound and an organometallic compound in an amount sufficient to solubilize the organomagnesium compound in hydrocarbon and (C) an active non-metallic halide, said non-metallic halide corresponding to the formula R'X wherein R' is hydrogen or a hydrocarbyl group containing a labile halogen atom as easily lost to another compound as the chloride atom of sec-butyl chloride and X is halogen; said reaction product being produced in a manner such that the organomagnesium component reacts with the non-metallic halide to form a hydrocarbon insoluble portion, and further provided that sufficient aluminum, in the form of a hydrocarbyl-aluminum compound represented by the formula $R_{3-a}AlX_a$ wherein R is hydrocarbyl, X is halide and a is a number from 0 to 1.5, is present in the catalytic reaction product in an amount sufficient to provide a reaction product that is catalytic for the polymerization of an α-olefin; the proportions of the foregoing components of said catalytic reaction product being such that the atomic ratio of Mg:TM is within the range from about 5:1 to about 2000:1, the atomic ratio of X:TM is within the range from about 50:1 to about 2000:1, the atomic ratio of Mg:X is within the range from about 0.2:1 to about 1:1, the atomic ratio of Mg:Al is at least 0.3:1, and the atomic ratio of Al:TM is not more than about 120:1 and said process is carried out at a polymerization temperature of at least 185° C.

4,250,289

PREPARATION OF COPOLYMERS FROM MALEIC ANHYDRIDE AND ALKENES

Walter Denzinger, Speyer, and Claus Cordes, Weisenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 10, 1979, Ser. No. 74,067

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1978, 2840501

Int. Cl.³ C08F *2/20, 222/06*

U.S. Cl. 526—201 **3 Claims**

1. In a process for the preparation of copolymers of maleic anhydride and C_6-C_{10}-alkenes by suspension copolymerization of the said monomers in the presence of a free radical initiator and a dispersant at an elevated temperature, in excess alkene as the suspension medium, the improvement that a poly(alkyl vinyl ether), where alkyl is of 1 to 20 carbon atoms, is employed as the dispersant.

4,250,290

PROCESS FOR THE CONTINUOUS MANUFACTURE OF SILOXANE POLYMERS

Louis P. Petersen, Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Jun. 18, 1979, Ser. No. 49,524

Int. Cl.³ C08G *77/06*

U.S. Cl. 528—14 **17 Claims**

1. A process for the continuous polymerization of silanol terminated diorganopolysiloxane polymers having a viscosity varying from 500 to 500,000 centipoise at 25° C. comprising:

(a) mixing degassed and preheated cyclopolysiloxanes with

an amount of a basic catalyst effective for catalyzing said continuous polymerization;

(b) passing the mixture of the polysiloxane and catalyst into a mixer having static elements which provide essentially uniform plug flow characteristics to the catalyzed mixture passing therethrough, maintained under pressure and providing sufficient residence time for completion of the polymerization and controlling the polymer viscosity by introducing to the initial part of the static mixer reaction zone from 100 to 500 parts per million of water as a chain-stopper;

(c) mixing into the reaction mixer an amount of a neutralizing agent effective for neutralizing the basic catalyst; and

(d) passing the solution of the neutralizing agent and reaction mixture through a mixer for completion of the neutralization.

4,250,291

MELT ADHESIVE BASED ON POLYAMIDE FROM BRANCHED CHAIN DIAMINE

Fritz Gude, and Siegfried Brandt, both of Wanne-Eickel, Fed. Rep. of Germany, assignors to Veba Chemie Aktiengesellschaft, Gelsenkirchen-Buer, Fed. Rep. of Germany

Continuation of Ser. No. 655,044, Feb. 4, 1976, which is a continuation of Ser. No. 503,538, Sep. 5, 1974, abandoned. This application Jun. 9, 1978, Ser. No. 913,994

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1973, 2344420

Int. Cl.³ C08G *69/26*

U.S. Cl. 528—338 **5 Claims**

4. A hot melt adhesive polyamide copolymer consisting essentially of the polymeric condensation product of dodecane dicarboxylic acid and azelaic acid and a diamine mixture consisting of 20–80 mol percent of hexamethylene diamine and 80–20 mol percent of a mixture of 3-aminomethyl-3,5,5-trimethylcyclohexylamine, 2,4,4-trimethylhexamethylene diamine and 2,2,4-trimethylhexamethylene diamine.

4,250,292

PROCESS FOR THE PREPARATION OF POLYURETHANE ELASTOMERS IN WHICH AT LEAST TWO REACTANT PORTIONS ARE INTRODUCED INTO SEPARATE POSITIONS OF A SCREW MACHINE

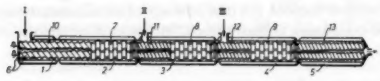
Georg Niederdellmann, Dormagen; Wilhelm Goyert, Cologne; Ernst Meisert, Leverkusen; Alfred Eitel; Hans Wagner, both of Dormagen, and Hans Hespe, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 13, 1979, Ser. No. 74,943

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1978, 2842806

Int. Cl.³ C08G *18/08*

U.S. Cl. 528—44 **10 Claims**



1. In a process for the continuous production of a polyurethane or polyurethane urea elastomer by the reaction of

(A) a polyisocyanate,

(B) a polyhydroxyl compound having a molecular weight of from 400 to 10,000,

(C) a chain extender containing at least two Zerewitinoff-active hydrogen atoms, having a molecular weight below 400, and optionally,

(D) a monoisocyanate and/or a compound which is monofunctional toward isocyanates,

(E) and optionally, activators, stabilizers, lubricants and other additives,

in a screw machine at temperatures in the range of 70° to 260° C., the improvement wherein one or more of components (A), (B) and (C) is introduced in at least two portions, at separate positions of said screw machine, each portion amounting to at least 4% by weight of the total quantity of the respective component.

4,250,293

LATENT AMINE SALTS OF BIS-PHENOL A

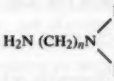
Burton D. Beitchman, Springfield; Donald E. Jefferson, Unionville, and John P. Seymour, Marcus Hook, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 19, 1979, Ser. No. 21,641

Int. Cl.³ C08G *59/50, 59/62*

U.S. Cl. 528—93 **8 Claims**

1. A latent curable epoxy resin composition having excellent shelf life at ambient temperature with an excellent cure rate at an elevated temperature which comprises a finely divided epoxy resin having a plurality of 1,2 epoxy groups, a lower softening point of not less than 40° C. and having distributed therein a catalytic quantity of an amine salt of bis-phenol A said amine represented by the formula:



wherein n is 2 or 3, and R is a C_1–C_4 alkyl group.

4,250,294

POLYMERS OBTAINED FROM POLYNITROAROMATIC COMPOUNDS

Rainer Hagel, Lichtenfels, and Klaus Redecker, Nuremberg, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Nov. 22, 1978, Ser. No. 962,865

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1977, 2752166

Int. Cl.³ C08G *83/00*

U.S. Cl. 528—210 **20 Claims**

1. A polymer having an aromatic or heterocyclic ring as the only structural element, said polymer containing at least 2 nitro groups on said aromatic or heterocyclic ring, the hetero atom of said hetercyclic ring being oxygen, nitrogen, or sulfur, the polymer having at least four recurring units and up to 20 recurring units said aromatic or heterocyclic ring optionally containing, in addition to said nitro groups, a hydroxy, methyl or methoxy group.

4,250,295

UNSATURATED POLYESTER RESINS CONTAINING AN ADDITIVE OF THE FORMULA R—OH WHICH ARE NOT INHIBITED BY THE OXYGEN OF THE AIR AND PROCESS FOR MAKING THE SAME

Giovanni Corrado, Rome, and Bruno Sopino, Colleferro, both of Italy, assignors to SNIA VISCOSA Societa Nazionale Industria Applicazioni Viscosa S.p.A., Milan, Italy

Filed Jul. 17, 1979, Ser. No. 58,203

Claims priority, application Italy, Jul. 26, 1978, 26109 A/78

Int. Cl.³ C08F *222/04*

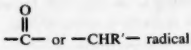
U.S. Cl. 528—272 **13 Claims**

1. A composition which is not inhibited by atmospheric oxygen and does not exhibit persistent residual surface tackiness, comprising an unsaturated polyester resin physically admixed with at least one compound having the formula (1)

R—X—OH (1)

wherein R represents an aliphatic or cycloaliphatic, saturated

or unsaturated radical, containing from 11 to 46 carbon atoms, and X represents a



wherein R' is hydrogen, an aliphatic or cycloaliphatic radical, said compound having a melting point higher than 30° C.

4,250,296

LEVELLING AGENT AND PROCESS FOR THE EVEN DYEING OF MATERIALS MADE OF SYNTHETIC FIBERS

Gerhard Weckler, Sulzbach; Hans J. Hauss, Frankfurt am Main; Karl Hintermeier, Frankfurt am Main, and Friedrich Engelhardt, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 15, 1978, Ser. No. 933,887

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1977, 2737239

Int. Cl.[3] **C08G** *63/68*

U.S. Cl. 528—295 **11 Claims**

1. A water soluble or dispersible polycondensate which is the reaction product of

(a) one part by weight of a linear or branched polyester having an average molecular weight of 600 to 5000 and being soluble or dispersible in water, said polyester being obtained from the polycondensation of 100 moles percent of carboxylic acid having more than one —COOH moiety with 90 to 120 moles percent of diol or polyol compounds wherein 5 to 40 moles percent of the polyester precursors have sulfo substituents and

(b) 0.2 to 2 parts by weight of a compound of the formula $R—O—(CH_2CH_2O)_m—CH_2CH_2OH$ wherein m is a number from 5 to 50 and R is selected from the group consisting of alkyl of 6–22 carbon atoms, alkenyl of 6–22 carbon atoms, alkanoyl of 6–22 carbon atoms, aryl of 6–22 carbon atoms, aralkyl of 6–22 carbon atoms, castor oil radical and

wherein R' is alkyl or alkenyl each having 6–22 carbon atoms, the reaction conducted at 100°–300° C. wherein volalite reaction by-products are removed by distillation during the reaction.

4,250,297

TRANSPARENT COPOLYAMIDE FROM ISOPHTHALIC ACID REACTANT

Werner Nielinger; Bert Brassat, and Hugo Vernaleken, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

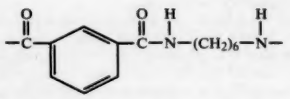
Continuation of Ser. No. 950,387, Oct. 11, 1978, abandoned, which is a continuation-in-part of Ser. No. 818,211, Jul. 22, 1977, abandoned. This application Sep. 17, 1979, Ser. No. 76,484

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1976, 2652465

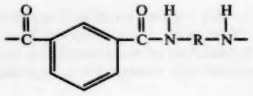
Int. Cl.[3] **C08G** *69/26*

U.S. Cl. 528—340 **3 Claims**

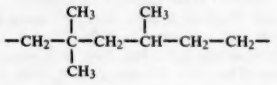
1. A solid copolyamide consisting of from 60 to 90 mole % of units of the formula



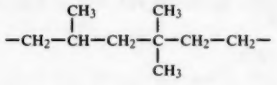
and from 40 to 10 mole % of units of the formula



wherein R is at least one member selected from the group consisting of (I)



and (II)



4,250,298

POLYAMINES CONTAINING AMIDE GROUPS

Wolfgang Lehmann, Leverkusen; Friedhelm Müller, Odenthal; Wilfried Löbach, Bonn; Günther Cramm, and Knut Hammerström, both of Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 15, 1978, Ser. No. 969,820

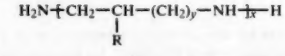
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1977, 2756469

Int. Cl.[3] **C08G** *69/48, 69/26*

U.S. Cl. 528—342 **17 Claims**

1. A water-soluble polyamine which is not self-crosslinking and which is obtained by reacting

(A) at least one water-soluble or water-dispersible amine containing an amide group, prepared by condensing (a) a mol of a dicarboxylic acid or amide-forming functional derivative thereof, (b) 0 to 30 mols of an aminocarboxylic acid containing at least three C atoms, or a lactam thereof, and (c) a polyalkylenepolyamine of the formula



in which

R is H or CH_3,

y each independently is 0 or 1, and

x is from 4 to 15,

or a mixture of such a polyalkylenepolyamine with an amine of the same formula but in which x is from 1 to 3,

with the proviso that the molar ratio of a:c is 1:1.75 to 3 in the absence of b and is 3 to 30 in the presence of b, and

(b) a compound which is polyfunctional and reacts with amino groups.

4,250,299
POLYAMINES CONTAINING AMIDE GROUPS

Wolfgang Lehmann, Leverkusen; Friedhelm Müller, Odenthal; Günther Cramm, Cologne; Knut Hammerström, Cologne, and Wilfried Löbach, Bonn, all of, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 15, 1978, Ser. No. 969,822

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1977, 2756431

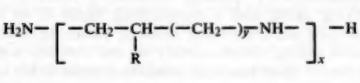
Int. Cl.³ C08G *69/48, 69/26*

U.S. Cl. 528—342 **12 Claims**

1. A water-soluble polyamine, obtained by reacting

(A) at least one water-soluble or water-dispersible basic polyamide which has been prepared by condensation of at least one aliphatic polyamine containing at least two primary amino groups and at least one secondary or tertiary amino group, or of a mixture of such a polyamine and at least one aliphatic, cycloaliphatic, araliphatic or heterocyclic polyamine containing two primary or two secondary amino groups or one primary and one secondary amino group, with at least one saturated aliphatic dicarboxylic acid containing 4–10 carbon atoms, or with an amide-forming derivative thereof,

(B) at least one polyalkylenepolyamine of the general formula



in which

R denotes H or CH_3,

Y is in each case the same or different and denotes the number 0 or 1 and

x denotes a number from 4 to 2,500,

or a mixture of such a polyalkylenepolyamine with at least one amine of the same general formula, but in which

x denotes a number from 1 to 3,

the weight ratio of basic polyamides A to polyalkylenepolyamines B ranging from 1 to 10:10 to 1, and

(C) an α,ω-alkyl dihalide, 0.01–0.5 mol of alkyl dihalide being used per mol of basic nitrogen atom in the basic polyamide and polyalkylenepolyamine.

4,250,300
FLUORINE-CONTAINING POLYESTERS, AND THEIR PRODUCTION AND USE

Takeo Saegusa, Kyoto; Akira Yamada, Osaka; Masaaki Iwase, Takarazuka, and Akitoshi Iwatani, Suita, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

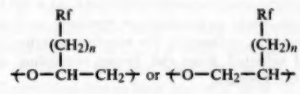
Continuation-in-part of Ser. No. 905,056, May 11, 1978, abandoned. This application Mar. 12, 1979, Ser. No. 19,588

Claims priority, application Japan, May 12, 1977, 52/55074

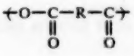
Int. Cl.³ C08G *73/24*

U.S. Cl. 528—401 **21 Claims**

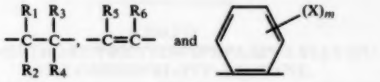
1. A fluorine-containing polyester which comprises as the constituting units (a) a group of the formula:



wherein Rf is a perfluoroalkyl group having 8 to 21 carbon atoms and n is an integer of 0 or 1 and (b) a group of the formula:



wherein R is one of the groups represented by the formulas:



wherein R_1 to R_6 is each a hydrogen atom or a lower alkyl group, R_1 and R_3 being optionally combined together at the terminal carbon atoms to form a cyclic ring, X is a halogen atom or a lower alkyl group and m is an integer of 0 to 4.

4,250,301
ANOMER ENRICHMENT OF ALKYL GLYCOSIDES OF AMINO SUGARS

Paul R. August, Wilmington, and George A. Reed, Middletown, both of Del., assignors to University of Delaware, Newark, Del.

Filed Sep. 24, 1979, Ser. No. 78,660

Int. Cl.³ C07H *15/04, 5/06*

U.S. Cl. 536—4 **5 Claims**

1. The process for the enrichment of β-anomers in an equilibrium mixture of α- and β-anomers of alkyl glycosides of amino sugars which comprises subjecting an alcoholic solution of such anomers, containing an inorganic base and 0.1 to 5.0% water based on the alcohol content of the solution, to a temperature of 20°–60° C. until there is no further decrease in the optical activity of the solution; then dissolving the anomer product of this step in a solvent consisting of a mixture of an aliphatic alcohol having 1–4 carbon atoms with an ester of an aliphatic alcohol and an aliphatic carboxylic acid, the ester having a maximum of 5 carbon atoms and the ratio of the alcohol to the ester being between 20:80 and 50:50 by volume, at a temperature up to the boiling point of the solution, then cooling the solution slowly to 0°–25° C. to crystallize out a mixture of the α- and β-anomers in which the proportions of β-anomer is still further increased.

4,250,302
Patent Not Issued For This Number

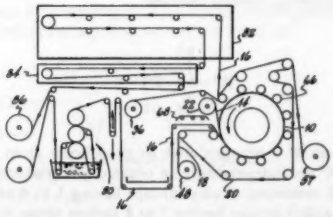
4,250,303
N-BENZYL ANTHRACYCLINES

Helen Y. Wu, San Jose; Thomas H. Smith, San Carlos, both of Calif., and David W. Henry, Chapel Hill, N.C., assignors to SRI International, Menlo Park, Calif.

Continuation-in-part of Ser. No. 947,874, Oct. 2, 1978, Pat. No. 4,177,264, which is a continuation-in-part of Ser. No. 842,787, Oct. 17, 1977, abandoned. This application Aug. 24, 1979, Ser. No. 69,560

Int. Cl.³ C07H *15/24*

U.S. Cl. 536—17 A **1 Claim**



1. The compound which is N,N-dibenzyl-13-dihydroadria-

mycin, together with its pharmaceutically acceptable acid addition salts.

4,250,304

2-DEOXY-2-SUBSTITUTED FORTIMICIN A AND B AND DERIVATIVES

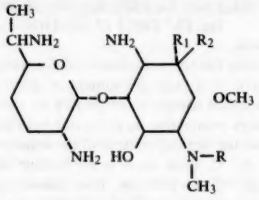
Jerry R. Martin; John S. Tadanier, both of Waukegan; Paulette Johnson, Zion, and Alex M. Nadzan, Gurnee, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Sep. 26, 1979, Ser. No. 79,145

Int. Cl.³ C07H *15/22*

U.S. Cl. 536—17 R **10 Claims**

1. A compound of the formula



wherein R is hydrogen, glycyl, β-alanyl, acetyl, or β-amino-lower-alkyl; R_1 is hydrogen, amino, azido, halo, glycylamido, β-alanylamido or 2-O-methanesulfonyl; and R_2 is hydrogen or halo, with the proviso that R_1 and R_2 cannot both be hydrogen; and their pharmaceutically acceptable salts.

4,250,305

PROCESS FOR PREPARING CELLULOSE ETHER

Motoyasu Saito, and Hideaki Mukohyama, both of Yatsushiro, Japan, assignors to Kohjin Co., Ltd., Tokyo, Japan

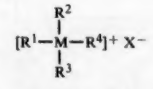
Filed Aug. 20, 1979, Ser. No. 67,667

Claims priority, application Japan, Sep. 1, 1978, 53-106312; Dec. 28, 1978, 53-16114; Feb. 15, 1979, 54-15487; Feb. 16, 1979, 54-16100

Int. Cl.³ C08B *11/02, 11/16, 11/193*

U.S. Cl. 536—84 **12 Claims**

1. A process for preparing a cellulose ether which comprises reacting celluloses untreated or treated with an aqueous solution of alkali hydroxide with an etherifying agent in the presence of an aqueous solution of alkali hydroxide, an organic solvent being substantially immiscible with water and capable of dissolving the etherifying agent and a quaternary salt having the following general formula:



(I)

wherein M is nitrogen atom or phosphorus atom, R^1, R^2, R^3 and R^4 are independently an organic group selected from the group consisting of alkyl groups having 1 to 4 carbon atoms and aralkyl groups having 7 to 8 carbon atoms and X^- is an anion.

4,250,306

PROCESS AND EQUIPMENT FOR PREPARING SWELLABLE CROSS-LINKED CARBOXYALKYLCELLULOSES FROM NATURAL CELLULOSE OR CELLULOSE HYDRATE AND USE THEREOF

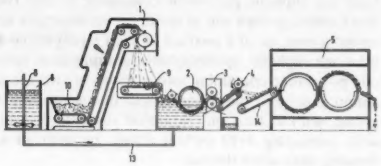
Helmut Lask; Arno Holst, both of Wiesbaden; Ehrenfried Nischwitz, Schmitten-Oberreifenberg, and Hans Sommer, Hofheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed May 29, 1979, Ser. No. 43,172

Claims priority, application Fed. Rep. of Germany, May 31, 1978, 2823736

Int. Cl.³ C08B *15/10*; D04H *1/42*

U.S. Cl. 536—88 **11 Claims**



1. A process for preparing swellable cross-linked carboxyalkylcelluloses by reacting cellulose, a carboxyalkylating etherifying agent, and a cross-linking agent in an aqueous alkaline medium, comprising effecting alkalizing, etherifying, and cross-linking simultaneously in one reaction step using fibers, textile sheet materials containing these fibers having a base of cellulose hydrate or of natural cellulose, or sheet materials from the group of films and sponge cloths composed of cellulose hydrate, by contacting

(a) said fibers or sheet materials with an ample quantity of an aqueous alkaline reaction mixture,

(b) removing part of the reaction mixture from the fibers or sheet materials contacted therewith, so that at least the quantity required for reaction is still present, wherein the molar relationships of the components of said quantity of the reaction mixture ranges, relative to 1 mole of cellulose, from 0.7 to 2.1 moles of alkali hydroxide, 10 to 30 moles of H_2O, 0.7 to 2 moles of the etherifying agent and 0.005 to 0.1 mole of the cross-linking agent, and

(c) treating the fibers or sheet materials containing said remainder of the aqueous alkaline reaction mixture with heat energy for the purpose of the actual chemical reaction.

4,250,307

PROCESS FOR THE PREPARATION OF 7-AMINO-CEPHALOSPORANIC ACID

Pierre Barthelemy, Barbery, France, assignor to Roussel Uclaf, Paris, France

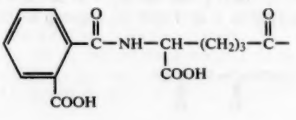
Division of Ser. No. 940,274, Sep. 7, 1978, Pat. No. 4,189,574. This application Sep. 28, 1979, Ser. No. 79,800

Claims priority, application France, Sep. 29, 1977, 77 29303

Int. Cl.³ C07D *501/18*

U.S. Cl. 544—030 **3 Claims**

1. A process for the preparation of 7-amino-cephalosporanic acid comprising reacting cephalosporin C or a salt thereof with phthalic anhydride in an aqueous medium, salifying if necessary the mixture, extracting the reaction mixture to recover a compound selected from the group consisting of the compound of the formula



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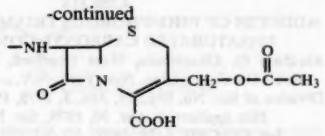


salts thereof selected from the group consisting of alkali metal, alkaline earth metal, ammonium, amine and quaternary ammonium salts and subjecting the latter to cleavage conditions to obtain 7-amino-cephalosporanic acid.

4,250,308

PROCESS FOR THE RECOVERY OF SOLID CYANURIC CHLORIDE (A)

Ralf Goedecke, Rodenbach; Martin Liebert, Steinbach; Wolfgang Nischk, Wesseling; Uwe Kurandt, Frankfurt am Main, and Dieter Mewes, Kleinostheim, all of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Hanau, Fed. Rep. of Germany

Filed Sep. 24, 1979, Ser. No. 77,920

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1978, 2843379

Int. Cl.³ C07D *251/28*

U.S. Cl. 544—190 **12 Claims**

1. A process for the recovery of solid cyanuric chloride by spraying liquid cyanuric chloride comprising spraying the cyanuric chloride into a separatory container while indirectly cooling said container sufficiently to solidify the cyanuric chloride.

4,250,309

HALOGENATED ALKENYL ISOCYANURATE COMPOUNDS

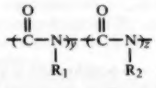
Edward E. Flagg, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 10,300, Feb. 8, 1979, abandoned. This application Oct. 1, 1979, Ser. No. 80,967

Int. Cl.³ C07D *251/34*

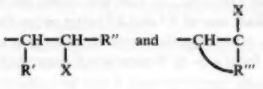
U.S. Cl. 544—221 **6 Claims**

1. A halogenated alkenyl isocyanurate compound of the formula



wherein:

(a) R_1 is selected from



wherein R′ is hydrogen or a $C_{1\text{-}10}$ radical selected from alkyl, alkenyl and oxo-, halo- or alkyl-substituted derivatives thereof; R″ is a $C_{2\text{-}10}$ radical selected from alkyl, alkenyl and oxo-, halo- or alkyl-substituted derivatives thereof, provided that at least one of R′ or R″ is alkenyl or an oxo-, halo- or alkyl-substituted derivative thereof; R‴ is a $C_{3\text{-}10}$ divalent radical containing ethylenic unsaturation selected from acyclic, cyclic and multicyclic alkenediyls and alkyl-, halo- or oxo-derivatives thereof; X is halogen;

(b) R_2 is a $C_{1\text{-}8}$ radical selected from alkyl, haloalkyl and aryl; and

(c) y is an integer from 1 to 3; and z is an integer from 0 to 2, provided that y+z equals 3.

4,250,310

3-[4-(3-METHOXY-PHENYL)-PIPERAZIN-1-YL]-1-(FURAN-2-CARBONYLOXY)-PROPANE

Karoly Felföldi; Jozsef Apjok; Mihaly Bartok; Jozsef Czombos; Arpad Molnar; Ferenc Noteisz, all of Szeged; Egon Karpati, and Laszlo Szporny, both of Budapest, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar R.T., Budapest, Hungary

Division of Ser. No. 859,928, Dec. 12, 1977, Pat. No. 4,140,790. This application Dec. 28, 1978, Ser. No. 974,082

Claims priority, application Hungary, Dec. 15, 1976, RI 605

Int. Cl.³ C07D *405/12*

U.S. Cl. 544—379 **1 Claim**

1. 3-[4-(3-methoxy-phenyl)-piperazin-1-yl]-1-(furan-2-carbonyloxy)-propane or a pharmaceutically effective acid addition or quaternary salt thereof.

4,250,311

P, AS, AND SB HEXAFLUORIDE ONIUM SALTS AS PHOTOINITIATORS

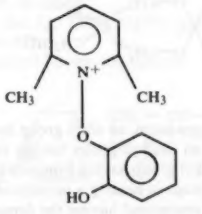
James V. Crivello, Elnora, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 103,914, Dec. 17, 1979, which is a division of Ser. No. 949,642, Oct. 10, 1978, which is a division of Ser. No. 789,419, Apr. 21, 1977, Pat. No. 4,136,102, which is a division of Ser. No. 574,006, May 2, 1975, which is a continuation-in-part of Ser. No. 466,374, May 2, 1974, abandoned, Ser. No. 466,375, May 2, 1974, abandoned, and Ser. No. 466,378, May 2, 1974, abandoned. This application Apr. 7, 1980, Ser. No. 137,831

Int. Cl.³ C07F *9/90, 9/68, 9/06*

U.S. Cl. 546—9 **1 Claim**

1.



4,250,312

PROCESS FOR PREPARING 4-PIPERIDONE SPIROKETAL COMPOUNDS

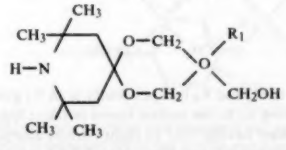
Yutaka Nakahara, Iwatsuki; Naohiro Kubota, Ageo, and Toshihiro Shibata, Omiya, all of Japan, assignors to Argus Chemical Corp., Brooklyn, N.Y.

Filed Dec. 28, 1979, Ser. No. 108,137

Int. Cl.³ C07D *405/04*

U.S. Cl. 546—19 **12 Claims**

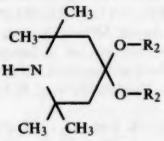
1. A process for preparing a 2,2,6,6-tetramethyl-4-piperidone spiroketal carbinol compound having the Formula I



I

in which R_1 is an alkyl group having from one to six carbon

atoms, comprising the steps of heating a mixture of trimethylolalkane compound having the formula $R_1—C(CH_2OH)_3$ and 2,2,6,6-tetramethyl-4-piperidine ketal compound having the Formula II



II

in which R_2 is an alkyl group having 1 to 12 carbon atoms or an ether-interrupted alkyl group having 3 to 12 carbon atoms and 1 to 2 ether oxygen atoms, or an acid addition salt thereof, removing alcohol having the formula R_2OH, and recovering 2,2,6,6-tetramethyl-4-piperidonespiroketal carbinol compound.

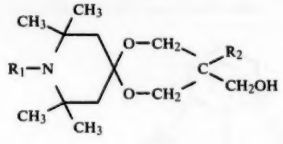
4,250,313

PROCESS FOR PREPARING 4-PIPERIDONE SPIROKETAL COMPOUNDS

Yutaka Nakahara, Iwatsuki; Naohiro Kubota, Ageo, and Toshihiro Shibata, Omiya, all of Japan, assignors to Argus Chemical Corp., Brooklyn, N.Y.

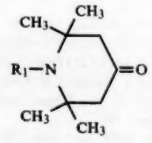
Filed Feb. 1, 1980, Ser. No. 117,464
Int. Cl.³ C07D *405/04*
U.S. Cl. 546—19 **14 Claims**

1. A process for preparing a 2,2,6,6-tetramethyl-4-piperidone spiroketal carbinol compound having the Formula I.



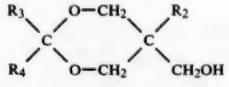
[I]

in which R_1 is a hydrogen atom, an alkyl group having one to ten carbon atoms, or an aralkyl group having seven to ten carbons, and R_2 is an alkyl group having from one to six carbon atoms, comprising the steps of heating a mixture of 2,2,6,6-tetramethyl-4-piperidone compound having the formula II



[II]

or an acid addition salt thereof, and a 1,3-dioxane compound having the formula III



[III]

in which each of R_3 and R_4 independently is an R_1 group or an aryl group having six to ten carbon atoms or taken together are an alkylene group having four to eight carbon atoms, removing R_3R_4CO compound, and recovering 2,2,6,6-tetramethyl-4-piperidonespiroketal compound.

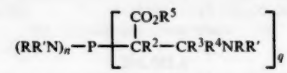
4,250,314

ADDUCTS OF PHOSPHOROUS TRIAMIDES AND α, β UNSATURATED CARBONYL COMPOUNDS

Abraham O. Okorodudu, West Deptford, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 866,579, Jan. 3, 1978, Pat. No. 4,183,817.
This application Apr. 30, 1979, Ser. No. 34,814
Int. Cl.³ C07F *9/28*; C07C *101/02, 101/20, 101/44*
U.S. Cl. 546—21 **16 Claims**

1. A compound of the formula



where n is 0,1 or 2; q is 1, 2 or 3 with the proviso the sum of n and q equals 3 and where R and R′ are each selected from alkyl of 1 to about 32 carbon atoms, aryl, aralkyl or alkaryl of 6 to about 30 carbon atoms and alicyclic (C_mH_{2m-1}) and RR′ may be $(CH_2)_m$ comprising part of a heterocyclic system selected from, pyrolidine or piperidine and where m is from 2 to 6; R^2, R^3 and R^4 may be H, or alkyl of 1 to 32 carbon atoms or aryl, alkaryl or aralkyl of 6 to 30 carbon atoms and R^5 may be alkyl or nitrogen-substituted alkyl of 1 to 30 carbon atoms, aryl, alkaryl or aralkyl of 6 to 30 carbon atoms.

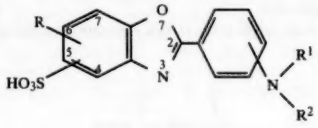
4,250,315

LIGHT-SCREENING BENZOXAZOLE DERIVATIVES

Bruno Poncioni, Muttenz, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Oct. 18, 1979, Ser. No. 86,253
Claims priority, application Switzerland, Oct. 31, 1978, 11210/78; Aug. 27, 1979, 7758/79
Int. Cl.³ C07D *263/54*
U.S. Cl. 346—198 **8 Claims**

1. Compounds represented by the formula



wherein R is in the 5- or 6-position and is hydrogen or an alkyl group containing 1 to 4 carbon atoms and R^1 and R^2 are independently hydrogen, an alkyl group containing 1 to 4 carbon atoms or a group having the formula $—(XO)_n—H$, wherein X is ethylene or ethylene substituted by methyl or ethyl and which contains a total of 2 to 4 carbon atoms and n is an integer of 1 to 10, at least one of R^1 and R^2 being other than hydrogen, or R^1 and R^2, taken together with the nitrogen to which they are attached, form a 5- to 7-membered, saturated heterocyclic ring,
and cosmetically acceptable salts thereof.

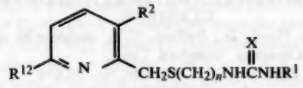
4,250,316

PYRIDYL GUANIDINE ANTI-ULCER AGENTS

Aldo A. Algieri, Fayetteville, and Ronnie R. Crenshaw, Dewitt, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Nov. 24, 1978, Ser. No. 963,477
Int. Cl.³ C07D *213/04, 213/57, 213/72, 213/70*
U.S. Cl. 546—287 **9 Claims**

1. A compound of the formula



I

wherein R^1 is a straight or branched chain alkynyl group containing from 3 to 9 carbon atoms, inclusive; R^2 is hydrogen, hydroxy, cyano, (lower)alkyl, (lower)alkoxy, halogen or amino; n is 2 or 3; X is NCN or CHCN; R^{12} is hydrogen or $(CH_2)_pNR^{13}R^{14}$; p is an integer of from 1 to 4, inclusive; and R^{13} and R^{14} each are independently hydrogen or (lower)alkyl; or a nontoxic, pharmaceutically acceptable salt thereof.

4,250,317
BENZOFURANYL-BENZIMIDAZOLES

Hans R. Meyer, Binningen, and Kurt Weber, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

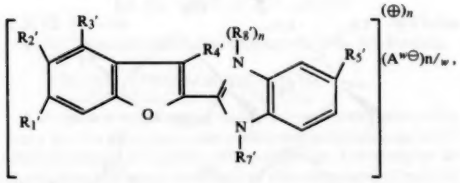
Division of Ser. No. 815,889, Jul. 15, 1977, Pat. No. 4,146,725. This application Dec. 21, 1978, Ser. No. 972,139

Claims priority, application Luxembourg, Jul. 26, 1976, 75458; Apr. 27, 1977, 77216

Int. Cl.[3] **C07D** *405/04, 405/14*

U.S. Cl. 548—327 **5 Claims**

1. A benzofuranyl-benzimidazole of the formula



wherein

R_1' represents alkoxy of 1 to 12 carbon atoms, alkenyloxy of 3 or 4 carbon atoms, phenoxy or phenylalkoxy containing 1 to 4 carbon atoms in the alkoxy moiety which is unsubstituted or substituted in the phenyl moiety by chlorine, alkyl or alkoxy, each of 1 to 4 carbon atoms, or represents hydroxy-(C_1–C_4)-alkoxy, (C_1–C_4)-alkoxy-(C_1–C_4)-alkoxy, cyano-(C_1–C_4)-alkoxy, carb-(C_1–C_4)-alkoxy-(C_1–C_4)-alkoxy, carbamoyl-(C_1–C_4)-alkoxy, or cyclohexyloxy or represents hydrogen if R_2' and R_3' together form butadienylene, or together with R_2' forms methylenedioxy or ethylenedioxy,

R_2' represents a hydrogen or halogen atom, alkyl or alkoxy, each of 1 to 4 carbon atoms, or, if R_1' represents hydrogen, together with R_3' forms butadienylene, or together with R_1' forms methylenedioxy or ethylenedioxy,

R_3' represents a hydrogen atom, alkyl or alkoxy, each of 1 to 4 carbon atoms, or, if R_1' represents hydrogen, together with R_2' forms butadienylene,

R_4' represents hydrogen, alkyl or alkoxy, each of 1 to 4 carbon atoms, or phenyl,

R_7' represents alkyl of 1 to 8 carbon atoms, alkenyl of 3 to 4 carbon atoms, cyclohexyl, hydroxyalkyl of 2 to 4 carbon atoms, alkoxyalkyl of altogether 3 to 6 carbon atoms, carboxyalkyl of 2 to 5 carbon atoms, carbalkoxyalkyl of altogether 3 to 9 carbon atoms, cyanoalkyl of 2 to 5 carbon atoms, benzyl which is unsubstituted or substituted by chlorine, methyl or methoxy, dialkylaminoalkyl of altogether 3 to 7 carbon atoms or phenethyl, or, if n is 0, also represents hydrogen,

R_8' represents hydrogen, alkyl of 1 to 6 carbon atoms, hydroxyalkyl of 2 to 4 carbon atoms, cyanoalkyl of 2 to 5 carbon atoms, carboxyalkyl of 2 to 5 carbon atoms, carbamoylalkyl of 2 to 6 carbon atoms, alkoxycarbonylalkyl of altogether 3 to 9 carbon atoms, alkenyl of 3 to 4 carbon atoms, or benzyl which is unsubstituted or substituted by chlorine, methoxy or methyl,

R_5' represents —$COOY_1$—, or —$CONY_1Y_2$, wherein Y_1 represents hydrogen, alkyl of 1 to 8 carbon atoms, alkenyl of 3 or 4 carbon atoms, cyclohexyl, hydroxyalkyl of 2 to 4 carbon atoms, alkoxyalkyl of altogether 3 to 6 carbon atoms, phenoxyalkyl of altogether 7 to 9 carbon atoms, carboxyalkyl of 2 to 6 carbon atoms, carbalkoxyalkyl of altogether 3 to 6 carbon atoms, cyanoalkyl of 2 to 5 carbon atoms, benzyl which is unsubstituted or substituted by methyl, chlorine or methoxy, phenyl which is unsubstituted or substituted by chlorine, methyl or methoxy, dialkylaminoalkyl of altogether 3 to 7 carbon atoms or phenethyl, and in the group —$COOY_1$ also represents a salt-forming cation, Y_2 represents hydrogen, alkyl of 1 to 4 carbon atoms, alkenyl of 3 or 4 carbon atoms or hydroxyalkyl of 2 to 4 carbon atoms, or Y_1 and Y_2 together with the nitrogen atom to which they are attached represent a 5- or 6-membered saturated unsubstituted heterocyclic ring selected from the group consisting of pyrrolidine, piperidine, imidazolidine, pyrazolidine, piperazine, morpholine or oxazolidine or said heterocyclic ring substituted by one or two alkyl groups of 1 to 4 carbon atoms,

n is 0 or 1,

$A^{w\ominus}$ represents a colourless anion and

w represents the valency of the anion A.

4,250,318
NOVEL 5-HYDROXYMETHYL OXAZOLIDINONES, THE METHOD OF PREPARING THEM AND THEIR APPLICATION IN THERAPEUTICS

Philippe L. Dostert, Chaville; Colette A. Douzon, Paris; Guy R. Bourgery, Colombes; Claude G. Gouret, Meudon; Gisele C. Mocquet, Paris, and Jean-Alain Coston, Garches, all of France, assignors to Delalande S.A., Courbevoie, France

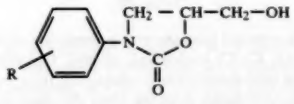
Filed Aug. 9, 1978, Ser. No. 932,212

Claims priority, application France, Aug. 26, 1977, 77 26105; May 23, 1978, 78 15342

Int. Cl.[3] **C07D** *263/24;* **A61K** *31/42*

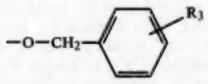
U.S. Cl. 548—229 **8 Claims**

1. A compound having the formula

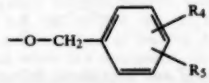


in which R is selected from the group consisting of:

a group having the formula



situated in para position and in which R_3 is selected from the group consisting of 2-cyano, 3-chloro, 3-bromo, 3-nitro, 3-cyano, 4-acetamido and 4—$NHCOC_2H_5$; and a group having the formula



situated in para position and in which the combination of (R_4, R_5) is selected from the group consisting of (3—Cl, 4—Cl), (3—Cl, 5—Cl), (3—Cl, 4—F), (3—NO_2, 4—Cl),

(3—CN, 4—F), (3—NO_2, 4—F), (3—NO_2, 5—CN) and (3—NO_2, 5—Cl).

4,250,319

DERIVATIVES OF THIOPHENE

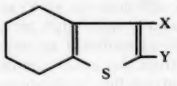
Joseph V. Karabinos, Orange, Conn., and Louis G. Nickell, Honolulu, Hi., assignors to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 589,401, Jun. 23, 1975, Pat. No. 4,013,681. This application Jan. 21, 1977, Ser. No. 760,825

Int. Cl.³ C07D *333/24*; A01N *43/07*

U.S. Cl. 549—61 **8 Claims**

1. (Replaces claim 7) A compound according to the formula



wherein X is cyano or C_1–C_4 carboalkoxy and Y is (chlorophenyl)ureido, (fluorophenyl) ureido, (trifluoromethylphenyl) ureido, (trifluoromethylchlorophenyl) ureido, (methylmethoxyphenyl) ureido or (chlorodimethoxyphenyl) thioureido.

4,250,320

PROCESS FOR PRODUCING SUBSTITUTED BENZOXAPHOSPHOLES

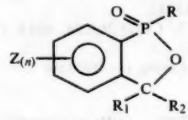
Raymond C. Grabiak, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jul. 6, 1979, Ser. No. 55,433

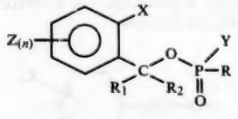
Int. Cl.³ C07F *9/02, 7/08*

U.S. Cl. 556—404 **3 Claims**

1. A process for producing a compound of the formula



wherein R is selected from the group consisting of lower alkyl, lower alkoxy, C_3–C_8 cycloalkyl, phenyl, biphenyl, phenoxyphenyl and substituted phenyl containing from one to three substituents individually selected from the class consisting of lower alkyl, lower alkoxy, lower dialkylamino, diphenylamino, C_3–C_8 cycloalkyl, fluoro, chloro, trifluoromethyl and trimethylsilyl; R_1 and R_2 are independently selected from the group consisting of hydrogen, lower alkyl, C_3–C_8 cycloalkyl, and phenyl; Z is selected from the group consisting of lower alkyl, lower alkoxy, phenyl, phenoxy, lower dialkylamino, diphenylamino, C_3–C_8 cycloalkyl, fluoro, chloro, trifluoromethyl and trimethylsilyl; n is an integer from 0 to 2; which comprises forming an admixture consisting essentially of a substituted benzyl phosphonate of the formula



wherein R, R_1, R_2, Z and n are above defined; X is bromo or iodo and Y is lower alkoxy; and an organolithium compound selected from the group consisting of alkyllithiums and aryllithiums in the presence of an aprotic solvent within a temperature range of −80° C. to −65° C.

4,250,321

1-DESCARBOXY-1-KETOESTER(KETOACID)-PROSTAGLANDINS

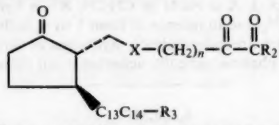
Middleton B. Floyd, Jr., Suffern, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed Sep. 27, 1979, Ser. No. 79,634

Int. Cl.³ C07C *177/00*

U.S. Cl. 560—53 **16 Claims**

1. Compounds of the formula



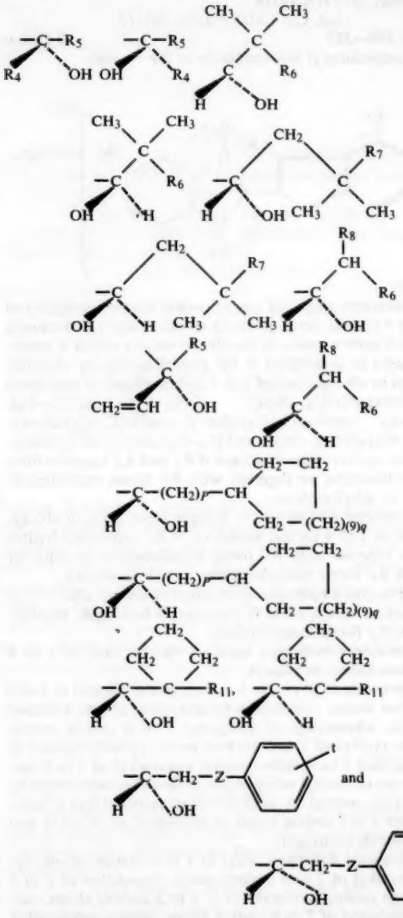
Ib

wherein R_2 is selected from the group hydroxy and C_1 and C_7 alkoxy;

X is selected from the group cis or trans —CH=CH—

$C_{13}C_{14}$ is selected from the group trans —CH=CH—

n is the integer 2, 3 or 4; and R_3 is selected from the group consisting of



Wherein R_4 is hydrogen or methyl; R_5 is selected from the

group consisting of C_4–C_7 alkyl; R_6 is selected from the group consisting of C_3–C_6 alkyl; R_7 is selected from the group consisting of C_2–C_4 alkyl; R_8 is selected from the group consisting of C_1–C_2 alkyl; R_{11} is selected from the group consisting of C_3–C_7 alkyl; p is an integer from 0 to 3; q is 1 or 2. Z is a divalent radical selected from the group consisting of —O— and —CH_2—; and t is selected from the group consisting of hydrogen, chloro, fluoro, dichloro, trifluoromethyl, methoxy; the racemic mixtures thereof, the mirror images thereof and where R_2 is hydroxy, the pharmaceutically acceptable salts thereof.

4,250,322

OLIGOURETHANACRYLATES AND METHODS FOR THEIR MANUFACTURE

Alexei V. Efimov, prospekt Lenina 85, kv. 43, Dzerzhinsk, Gorkovskoi oblasti; Alfred A. Berlin, Leninsky prospekt 57, kv. 9, Moscow; Tamara Y. Kefeli, Krasnoprudnaya ulitsa, 22/24, kv. 103, Moscow; Nina V. Varlamova, Dmitrovskoe shosse 40/7, kv. 20, Moscow; Grigory M. Strongin, prospekt Lenina 83, kv. 2a, Dzerzhinsk, Gorkovskoi oblasti; Judif M. Altshuler, Uchebny pereulok, 8, kv. 67, Dzerzhinsk, Gorkovskoi oblasti, and Boris I. Kolomazov, prospekt Pobedy 1/2, kv. 8, Dzerzhinsk, Gorkovskoi oblasti, all of U.S.S.R.

Continuation of Ser. No. 467,516, May 6, 1974, abandoned, which is a continuation of Ser. No. 334,483, Feb. 2, 1973, abandoned. This application Aug. 10, 1979, Ser. No. 65,633

Int. Cl.[3] **C07C** *125/073, 125/075*

U.S. Cl. 560—26 **20 Claims**

1. An Oligourethanacrylate characterized by the formula:

$$CH_2{=}CH{-}COOCH_2CH_2NHCOO(CH_2)_4OOCNHCH_2CH_2OOC{-}CH{=}CH_2.$$

8. A method for preparing oligourethanacrylates comprising carry out the reaction of non-equilibrium polycondensation of chloroformates of polyols with polyamines and telogens selected from the group consisting of chloroformates of monesters of alkyleneglycols and acids of the acrylic series, chloroformates of monoesters of bis-phenols and acids of the acrylic series, monoaminoalkyl esters of acids of the acrylic series, N-substituted monoaminoalkyl esters of acids of the acrylic series, in a medium of organic solvents in the presence of acceptors of hydrogen chloride evolved in the course of the reaction, at temperatures within the range from minus 10° C. to the boiling point of the particular solvent used in the process.

4,250,323

1-DESCARBOXY-1-KETOESTER(KETOACID)-PROSTAGLANDINS

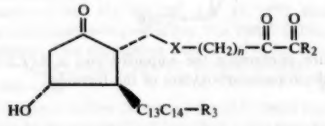
Middleton B. Floyd, Jr., Suffern, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed Sep. 27, 1979, Ser. No. 79,633

Int. Cl.[3] **C07C** *177/00*

U.S. Cl. 560—53 **32 Claims**

1. Compounds of the formula

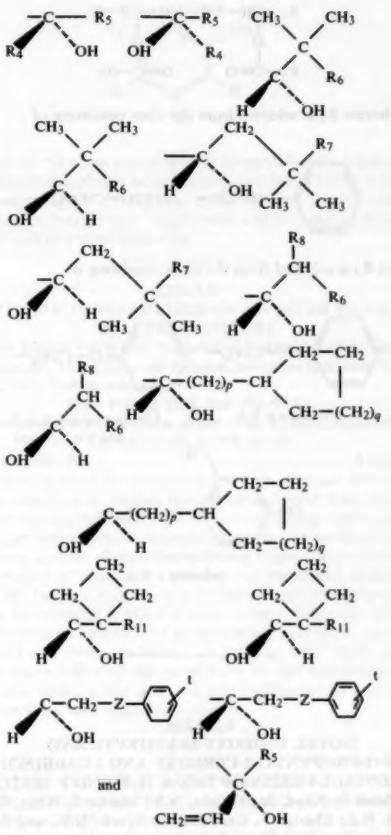


wherein R_2 is selected from the group hydroxy and C_1 to C_7 alkoxy;

X is selected from the group cis or trans —CH=CH—;

C_{13} C_{14} is selected from the group trans —CH=CH—

n is the integer 2, 3 or 4; and R_3 is selected from the group consisting of:



wherein R_4 is hydrogen or methyl; R_5 is selected from the group consisting of C_4–C_7 alkyl; R_6 is selected from the group consisting of C_3–C_6 alkyl; R_7 is selected from the group consisting of C_2–C_4 alkyl; R_8 is selected from the group consisting of C_1–C_2 alkyl; R_{11} is selected from the group consisting of C_3–C_7 alkyl; p is an integer from 0 to 3; q is 1 or 2; Z is a divalent radical selected from the group consisting of —O— and —CH_2—; and t is selected from the group consisting of hydrogen, chloro, fluoro, dichloro, trifluoromethyl, methoxy; the racemic mixtures thereof; the mirror images thereof and where R_2 is hydroxy, the pharmaceutically acceptable salts thereof.

4,250,324

WATER-DEGRADABLE ESTERS AND PROCESS FOR THE PREPARATION THEREOF

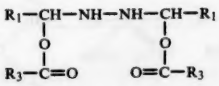
Marvin L. Beasley, P.O. Box 364, Alva, Okla. 73717, and Norman G. Rhode, P.O. Box 626, Fayette, Iowa 52142

Continuation of Ser. No. 607,578, Aug. 25, 1975, abandoned, which is a continuation-in-part of Ser. No. 342,058, Mar. 16, 1973, abandoned, which is a continuation-in-part of Ser. No. 197,309, Aug. 9, 1971, abandoned. This application Nov. 18, 1977, Ser. No. 852,722

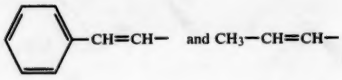
Int. Cl.[2] **C07C** *109/00*

U.S. Cl. 560—62 **13 Claims**

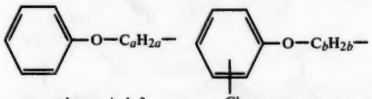
1. A water-degradeable compound having the formula



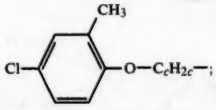
wherein R_1 is selected from the class consisting of



and R_3 is selected from the class consisting of



where a is 1-3; where n is 2 or 3 and b is 1-3; and



where c is 1-3.

4,250,325

NOVEL 15-DEOXY-16-ETHYNYL AND -16-(1-PROPYNYL)-1-CARBOXY AND 1-CARBINOL PROSTAGLANDINS OF THE A, D, E AND F SERIES

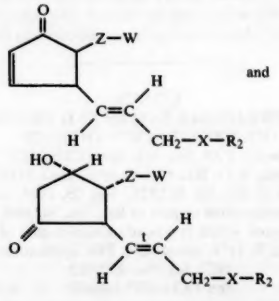
Middleton B. Floyd, Jr., Suffern, N.Y.; Martin J. Weiss, Oradell, N.J.; Charles V. Grudzinskas, Nyack, N.Y., and Sow-Mei L. Chen, Park Ridge, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 857,848, Dec. 5, 1977, Pat. No. 4,190,596, Ser. No. 857,849, Dec. 5, 1977, Pat. No. 4,190,597, and Ser. No. 857,714, Dec. 5, 1977, Pat. No. 4,191,699, each is a continuation-in-part of Ser. No. 706,343, Jul. 19, 1976, Pat. No. 4,061,670. This application Dec. 14, 1978, Ser. No. 969,479

Int. Cl.[3] **C07C** *177/00*

U.S. Cl. 560—121 **8 Claims**

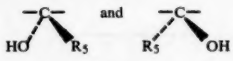
1. An optically active compound of the formula



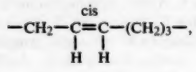
and

wherein W is;

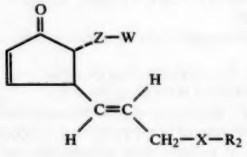
R_1 is selected from the group consisting of hydrogen and C_1 to C_6 alkyl; R_2 is selected from the group consisting of C_3 to C_7 alkyl; X is selected from the group consisting of a divalent moiety of the formula



R_5 is selected from the group consisting of 1-propynyl, ethynyl and trimethylsilylethynyl; Z is selected from the group $-(CH_2)_6-$,



$-(CH_2)_4-S-CH_2-$ and $-(CH_2)_4-O-CH_2-$; with the proviso that when Z is selected from the group $-(CH_2)_6-$, $-(CH_2)_4-S-CH_2-$ and $-(CH_2)_4-O-CH_2-$ then the compounds cannot be



the racemic mixtures thereof, and when R_1 is hydrogen, the pharmacologically acceptable salts thereof.

4,250,326

METHOD OF REDUCING THE CONTENTS OF HALOETHYNYL-CONTAINING IMPURITIES IN SYNTHETIC DIHALOETHENYL PYRETHROID INSECTICIDES OR INTERMEDIATES BY REACTION WITH PHOSPHITES

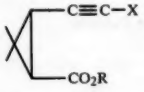
Morris L. Fishman, East Windsor, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Oct. 22, 1979, Ser. No. 87,273

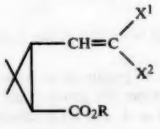
Int. Cl.[3] **C07B** *21/00;* **C07C** *69/743*

U.S. Cl. 560—124 **12 Claims**

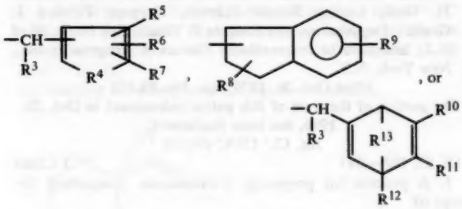
1. A process for reducing the content of a 3-(haloethynyl)cyclopropanecarboxylate impurity of the formula



in a mixture containing the impurity and a 3-(2,2-dihaloethenyl)cyclopropanecarboxylate of the formula



wherein X^1 and X^2 are the same or different, and each is a fluorine, chlorine, or bromine atom; X is a fluorine, chlorine, or bromine atom, and is the same as X^1 or X^2; and R is an alkyl group of 1 to 4 carbon atoms or is the residue R^1 of an alcohol R^1OH wherein R^1 is a group of the formula



in which R^3 is hydrogen, lower alkyl, ethynyl, or cyano; R^4 is divalent oxygen, divalent sulfur, or vinylene; R^5, R^6, and R^7 are independently hydrogen, lower alkyl, halogen, lower alkenyl, phenyl, phenoxy, benzyl, phenylthio, or any two of R^5, R^6, and R^7 are joined to form a divalent methylenedioxy group attached to two adjacent ring carbon atoms of a phenyl ring, with the proviso that when R^5, R^6, or R^7 contains a phenyl ring such phenyl ring may be substituted with one to three substituents selected from halogen and lower alkyl; R^8 is hydrogen, lower alkyl, lower alkoxy, lower alkenyl, lower alkenyloxy, phenyl or benzyl; R^9 is hydrogen, halogen, lower alkyl, lower alkoxy, lower alkenyl, lower alkenyloxy, lower alkylthio, lower alkylsulfinyl, lower alkylsulfonyl, phenyl, phenoxy, benzoyl, nitro or cyano; R^{10} and R^{11}, the same or different, are hydrogen, lower alkyl, halogen, cyano, lower alkyloxycarbonyl, or lower alkylaminocarbonyl; R^{13} is an atom of oxygen or sulfur, N—R^{14} where R^{14} is hydrogen or lower alkyl, or a methylene group; and R^{12} is phenyl, benzyl, or benzoyl, which may be substituted on the phenyl ring with halogen or lower alkyl,

which comprises contacting said mixture with a phosphite of the formula

$$P(OR^2)_3$$

wherein the R^2 groups are the same or different and each is an alkyl group of 1 to 6 carbon atoms or a phenyl group, so that the phosphite and haloethynyl impurity chemically interact, and thereafter recovering the dihaloethenylcyclopropanecarboxylate from the reaction mixture.

4,250,327

POLYMERIC YELLOW COLORANT

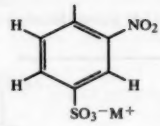
Daniel J. Dawson, Los Altos; Kenneth M. Otteson, San Bruno, and Roman Davis, Palo Alto, all of Calif., assignors to Dynapol, Palo Alto, Calif.

Continuation of Ser. No. 786,310, Apr. 11, 1977, abandoned, which is a continuation-in-part of Ser. No. 748,575, Dec. 8, 1976, abandoned. This application Jan. 2, 1979, Ser. No. 516

Int. Cl.³ C07C *143/55, 101/26, 69/353*

U.S. Cl. 560—169 **47 Claims**

1. A polymeric yellow colorant soluble in room temperature pH 7 water to an extent of not less than 1,000 ppm by weight, and comprising (1) an amine containing, nonchromophoric, essentially linear backbone polymer, said backbone polymer having a molecular weight of from 1,000 to 200,000 daltons and (2) a plurality of chromophores covalently depending from the amine moieties of said backbone polymer, said chromophores having the basic nucleus:



wherein M^+ is a pharmacologically acceptable cation, and said pendant chromophores being directly covalently linked to said backbone polymer through the amine moieties thereof via an aromatic carbon-nitrogen single bond and defining a nitrosulfanilic acid structure therewith.

4,250,328

METHOD FOR SEPARATION OF AN ESTER FROM A REACTION MIXTURE

Kiyoshi Fujita; Yukiyoshi Ito, both of Yokkaichi, and Shigeru Kamimori, Matsuzaka, all of Japan, assignors to Kyowa Yuka Co., Ltd., Tokyo, Japan

Filed Feb. 6, 1979, Ser. No. 9,793

Claims priority, application Japan, Feb. 8, 1978, 53-12299

Int. Cl.³ C07C *67/48, 69/54*

U.S. Cl. 560—205 **3 Claims**

1. In a method for producing an ester selected from the group consisting of methyl isobutyrate and methyl methacrylate by reacting methanol with the corresponding organic acid, the improvement which comprises: reacting the methanol with an excess amount of the corresponding organic acid based on the amount of methanol; removing the unreacted methanol from the reaction mixture as a methanol-ester azeotrope; distilling the resulting mixture of ester, water and organic acid in a distillation column to form an ester-water azeotrope; separating said ester-water azeotrope to form an ester layer and a water layer; refluxing said ester layer to said distillation column; and isolating the ester as a side cut flow of an overhead fraction from said distillation column.

4,250,329

CARBONYLATION PROCESS

Gary B. McVicker, Westfield, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 799,589, May 23, 1977, abandoned, which is a continuation-in-part of Ser. No. 166,615, Jul. 27, 1971, abandoned, which is a continuation-in-part of Ser. No. 51,669, Jul. 1, 1970, abandoned. This application May 25, 1979, Ser. No. 42,425

Int. Cl.³ C07C *67/36*

U.S. Cl. 560—232 **15 Claims**

1. A carbonylation process for the preparation of carboxylic acid esters which comprises:

(A) contacting carbon monoxide with a least one C_1 to C_{20} hydrocarbyl alkanol at a temperature in the range from about 100° to about 200° C. and at a carbon monoxide partial pressure in the range from about 1000 to about 4000 psig in the presence of a catalyst system having the general formula:

$$B_xMe[Me'(CO)_a(L)_b]_2$$

and an iodine containing cocatalyst in cocatalyst to catalyst molar ratio ranging from about 1 to about 16, wherein B is a Lewis base capable of coordinating with a Group IIA metal, Me' is a transition metal selected from the group consisting of metals of Group VIII of the Periodic Table of Elements, Me is a Group IIA metal, L is a uni- or polydentate ligand or hydrocarbon capable of coordinating with said transition metal; x is a positive integer ranging from 1 to 4; a is a positive integer ranging from 1 to 5 and b is an integer ranging from 0 to 4, with the proviso that the sum of a and b is 5 or less; and

(B) obtaining at least one carboxylic acid ester reaction product from said carbonylation process.

8. The process of claim 1 wherein the alkanol is methanol.

4,250,330

PROCESS FOR THE RECOVERY OF THE SOLVENT AND OF THE BY-PRODUCED METHYLACETATE IN THE SYNTHESIS OF TEREPHTHALIC ACID

Giuseppe Costantini, Mogliano Veneto; Mauro Serafini, Milan, and Pietro Paoli, Carpenedo-Mestre, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 892,195, Mar. 31, 1978, abandoned. This application Jan. 30, 1980, Ser. No. 116,851

Claims priority, application Italy, Apr. 13, 1977, 22408 A/77

Int. Cl.[3] **C07C** *51/255, 67/00, 67/48;* **B01D** *3/34*

U.S. Cl. 562—409 **7 Claims**

1. In a process for the synthesis of terephthalic acid, comprising the oxidation of para-xylene in acetic acid solution, at a temperature of from 100° to 230° C. and at a pressure from 1 to 30 kg/cm^2, and in the presence of a catalytic system based on manganese, bromine and cobalt, whereby water is formed and methyl-acetate is by-produced during the oxidation, whereby solid terephthalic acid is separated from the mother liquor and whereby one withdraws from the oxidation zone a liquid which is obtained by condensing the vapors released during the oxidation and which are mainly consisting of acetic acid and water, the improvement for the recovery of the acetic acid solvent, the catalyst and the methyl acetate, comprising:

(a) feeding the liquid obtained by condensing the released vapors and said mother liquor to an azeotropic distillation system in which the azeotropic agent is isobutyl-acetate;

(b) condensing the light ends of the azeotropic distillation, which are richer in water, and separating them into an aqueous phase and an organic phase, wherein the aqueous phase, which is lower and contains isobutyl-acetate and methyl-acetate, is conveyed to a stripping zone, whereby isobutyl-acetate and methyl-acetate are recovered, and wherein the organic phase is recycled to the azeotropic distillation system.

4,250,331

REMOVAL OF ORGANIC ACIDS FROM DILUTE AQUEOUS SOLUTIONS OF SALTS OF ORGANIC ACIDS BY SUPERCRITICAL FLUIDS

Edward J. Shimshick, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 9, 1979, Ser. No. 83,147

Int. Cl.[3] **C07C** *51/42, 53/00*

U.S. Cl. 562—485 **8 Claims**

1. A process comprising contacting an aqueous solution of at least one metal salt of a carboxylic acid with a supercritical fluid comprising at least 10 mole % carbon dioxide at from 35° to 200° C. and from 80 to 500 atm, whereby the carbon dioxide reacts with the metal salt of a carboxylic acid to release the free carboxylic acid, forming an aqueous phase and a separate supercritical fluid phase and recovering one or more carboxylic acids derived from a salt or salts of a carboxylic acid contained in the original dilute aqueous solution from the supercritical phase by lowering the pressure of the supercritical fluid from 5 to 85%.

4,250,332

PROCESS FOR PREPARING ACYL TRIMETHYL CYCLOHEXENE DERIVATIVES AND USE OF INTERMEDIATES THEREFOR IN AUGMENTING OR ENHANCING THE AROMA OR TASTE OF A CONSUMABLE MATERIAL

Robert W. Trenkle, Bricktown; Braja D. Mookherjee, Holmdel; John B. Hall, Rumson; Robin Kasper, Eatontown; Manfred H. Vock, Locust; Ronald Schreck, Keyport; Edward J. Granda, Englishtown, and Joaquin F. Vinals, Red Bank, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Oct. 26, 1979, Ser. No. 88,451

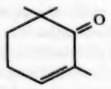
The portion of the term of this patent subsequent to Oct. 29, 1996, has been disclaimed.

Int. Cl.[3] **C07C** *49/203*

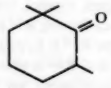
U.S. Cl. 568—347 **1 Claim**

1. A process for preparing β-damascone comprising the steps of:

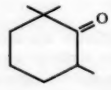
(a) treating with hydrogen a compound having the structure:



using a palladium-on-calcium carbonate catalyst in the presence of anhydrous ethanol to produce a compound having the structure:



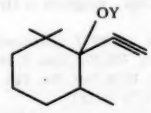
(b) treating the compound having the structure:



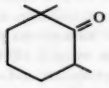
with the compound having the structure:

ZC≡CH

in order to produce the compound having the structure:

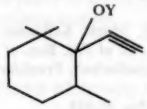


wherein Z is H, MgX′, Li, Na or K; Y is MgX′, Li, Na or K and X′ is Cl, Br or I; wherein when Z is H, the reaction takes place in the presence of an alkali metal hydroxide and either ethylene diamine or dimethyl sulfoxide with the loading per liter of dimethyl sulfoxide or ethylene diamine being from about 0.38 up to about 0.5 moles of alkali metal hydroxide to 5.0–6.25 moles of compound having the structure:

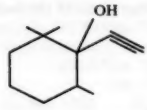


and with the reaction temperature being from about −10° C. up to about +80° C.; and wherein when Z is not H, the reaction takes place at a temperature of from −50° C. up to −10° C.;

(c) reacting the compound having the structure:

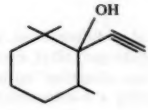


with water producing the compound having the structure:

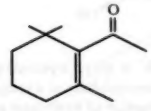


in the presence of a weak acid;

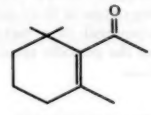
(d) reacting the compound having the structure:



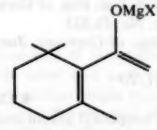
with formic acid under reflux conditions at atmospheric pressure to produce the compound having the structure:



(e) reacting the compound having the structure:

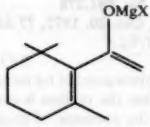


with RMgX to produce the compound having the structure:

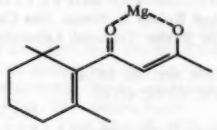


wherein R is C_1–C_6 alkyl and X is Cl, Br or I in the presence of a solvent which is inert in the reaction mass at a reaction temperature of between 20° and 35° C. at atmospheric pressure;

(f) reacting the compound having the structure:

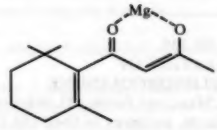


with acetaldehyde to produce the compound having the structure:

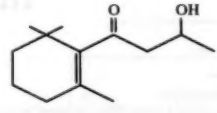


at a temperature of between −10° C. and +15° C. in the presence of an inert solvent where the weight ratio of inert solvent:acetaldehyde is in the range of from about 2:1 up to 5:1;

(g) reacting the compound having the structure:

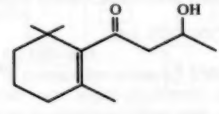


with water or with aqueous mineral acid to produce the compound having the structure:



the reaction temperature being between 10° C. and 40° C.;

(h) reacting the compound having the structure:



with a dehydrating agent in the presence of an inert solvent, said dehydration reagent being selected from the group consisting of acetic anhydride, phosphoric acid and para toluene sulfonic acid, said dehydration reaction taking place in the presence of a weak base selected from the group consisting of sodium acetate, potassium acetate, sodium carbonate and potassium carbonate, the weight ratio of keto alcohol:solvent varying between 1:0.5 and 1:10, the mole ratio of keto alcohol:dehydrating agent being between 1:0.25 and 1:1 and the weight ratio of dehydrating agent:weak base being between 1:1 and 10:1.

4,250,333

PROCESS FOR THE SELECTIVE MONOETHERIFICATION OF PYROCATECHOL

Michel Rakoutz, Oullins, France, assignor to Philagro, Lyons, France

Filed Oct. 12, 1978, Ser. No. 951,278

Claims priority, application France, Oct. 20, 1977, 77 32340

Int. Cl.³ C07C *41/01*

U.S. Cl. 568—652 **9 Claims**

1. Process for the etherification of pyrocatechol by means of methallyl chloride, characterised in that the raction is carried out in an aprotic solvent medium in the presence of an alkali metal carbonate or bicarbonate.

4,250,334

METHOD OF SYNTHESIZING FLUOROMETHYLHEXAFLUOROISOPROPYL ETHER

Clifford L. Coon, Fremont, and Robert L. Simon, San Carlos, both of Calif., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Dec. 26, 1979, Ser. No. 107,117

Int. Cl.³ C07C *41/01, 41/42*

U.S. Cl. 568—683 **16 Claims**

1. The method of synthesizing fluoromethyl-1,1,1,3,3,3-hexafluoroisopropyl ether which comprises adding hexafluoroisopropyl alcohol to a mixture comprising a stoichiometric excess of formaldehyde and hydrogen fluoride, plus sufficient sulfuric acid to sequester most of the water produced by the reaction, said mixture being maintained at a temperature of at least 57° C. to cause vapor formation by boiling of the fluoromethylhexafluoroisopropyl ether formed; and collecting and condensing said vapor.

4,250,335

PREPARATION OF 2,3,5-TRIMETHYLHYDROQUINONE

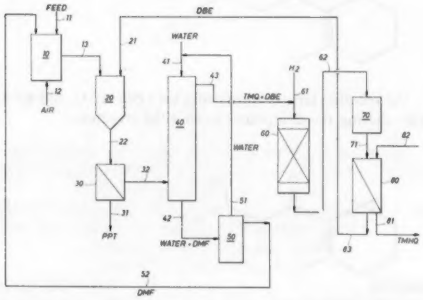
Johan G. A. Bitter; Rudolf J. Maas, and Jacobus H. Scheerman, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 17, 1977, Ser. No. 769,810

Claims priority, application United Kingdom, Feb. 19, 1976, 6606/76

Int. Cl.³ C07C *37/00*

U.S. Cl. 568—771 **6 Claims**



1. In the process for the preparation of 2,3,5-trimethylhydroquinone by (a) catalytic oxidation of a trimethylphenol starting material selected from the class consisting of 2,3,5-trimethylphenol, 2,3,6-trimethylphenol and mixtures thereof by reaction with oxygen in the presence of a cobalt chelate complex in a dimethylformamide solvent to afford 2,3,5-trimethyl-p-benzoquinone followed by (b) catalytic hydrogenation of the 2,3,5-trimethyl-p-benzoquinone thus formed by reaction with hydrogen in the presence of a noble metal catalyst, the improvement which comprises; (1) mixing the 2,3,5-trimethyl-p-benzoquinone containing reaction mixture from step (a) with di-n-butyl ether and water to form a di-n-butyl ether phase containing 2,3,5-trimethyl-p-benzoquinone, a precipitate comprising the cobalt catalyst and an aqueous phase containing the dimethylformamide reaction solvent, (2) separating the di-n-butyl ether phase from the precipitate and aqueous phase, and (3) subjecting the separated di-n-butyl ether phase to catalytic hydrogenation according to reaction step (b), said di-n-butyl ether functioning as the reaction solvent.

4,250,336

PROCESS FOR THE MANUFACTURE OF RESORCINOLS FROM δ-KETOCARBOXYLIC ACID ESTERS

Werner H. Müller, Eppstein; Karl E. Mack, Kelkheim, and Hansjörg Hey, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

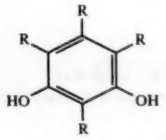
Filed Jun. 6, 1979, Ser. No. 45,941

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1978, 2825073

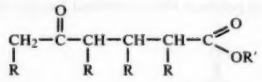
Int. Cl.³ C07C *37/00*

U.S. Cl. 568—772 **13 Claims**

1. Process for the manufacture of resorcinols of the formula



wherein the radicals R may be identical or different and, independent from one another, each are hydrogen, alkyl, cycloalkyl, aryl, alkoxy or carbalkoxy having altogether up to 12 carbon atoms, which comprises reacting a δ-ketocarboxylic acid ester of the formula



wherein R is defined as above and R' is alkyl, cycloalkyl or aryl of up to 8 carbon atoms, in the gaseous phase at a temperature of from 250° to 500° C. in the presence of hydrogen and a two-component catalyst, the first component consisting of one or more carrier materials containing at least one compound of a metal selected from the group consisting of Groups VIII and IB and the second component consisting of one or more carrier materials containing at least one compound of a metal of Groups II A, IV A, III B and IV B of the periodic system.

4,250,337

TWO STAGE HYDROGENATION TO MAKE NEOPENTYL GLYCOL

Manfred zur Hausen; Manfred Kaufhold, and Erhard Lange, all of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jun. 22, 1979, Ser. No. 51,321

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1978, 2827795

Int. Cl.³ C07C *31/20*

U.S. Cl. 568—853 **6 Claims**

1. A process for the production of neopentyl glycol consisting essentially of

reacting isobutyraldehyde, formalin and an aldol condensation catalyst to form a crude hydroxypivalaldehyde, con-

taining the monoisobutyric acid ester of NPG as an impurity;

high-pressure hydrogenating the crude hydroxypivalaldehyde obtained directly as the non-aqueous phase product thereof in the liquid phase over a barium-activated copper chromite catalyst, in the presence of 3–8% of water, and in two stages wherein, in the first stage, the temperature is 120°–160° C. and the charge of hydrogenation starting materials is 0.05–1.0 liter/liter of catalyst.h, and in the second stage, the temperature is 170°–200° C. and the charge of hydrogenation starting material is 0.05–1.0 liter/liter of catalyst.h,

whereby there is obtained neopentyl glycol having a degree of purity of above 98% as determined by gas chromatographic analysis.

4,250,338

BRIDGED KETONES AND PROCESS FOR PREPARING SAME

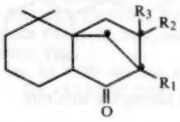
Mark A. Sprecker, Sea Bright; James M. Sanders, Eatontown; William L. Schreiber, Jackson; Hugh Watkins, Lincroft; Joaquin F. Vinals, Red Bank, all of N.J.; Edward J. Shuster, Brooklyn, N.Y.; Thomas J. O'Rourke, Red Bank, N.J.; Myrna L. Hagedorn, Highland Park, N.J., and Philip Klemarczyk, Old Bridge, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Nov. 16, 1979, Ser. No. 95,149

Int. Cl.³ C07C *49/453*

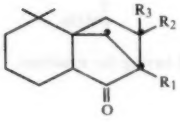
U.S. Cl. 568—343 **7 Claims**

1. A tricyclic ketone having the structure:

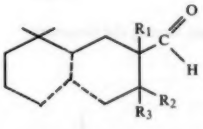


wherein R_1, R_2 and R_3 are the same or different and each represents hydrogen or C_1–C_3 lower alkyl.

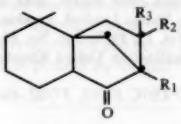
6. The process for preparing a compound having the structure:



wherein R_1, R_2 and R_3 are the same or different and each represents hydrogen or C_1–C_3 lower alkyl, comprising the step of intimately admixing a compound having the generic structure:



wherein one of the dashed lines represents a carbon-carbon double bond and each of the other dashed lines represent carbon-carbon single bonds, and R_1, R_2 and R_3 are each the same or different, and each represents hydrogen or C_1–C_3 lower alkyl, with a mineral acid selected from the group consisting of, hydrochloric acid, sulfuric acid, phosphoric acid, and para-toluene sulfonic acid and heating the resulting mixture at a temperature of from 60° C. up to about 80° C. for a time period such that the compound having the structure:



is formed.

4,250,339

PROCESS FOR PRODUCING METHACROLEIN

Teruhisa Sakamoto; Kazuhiko Sekizawa, and Keiichi Kihara, all of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shin-nanyo, Japan

Filed Nov. 30, 1979, Ser. No. 98,774

Claims priority, application Japan, Nov. 22, 1978, 53-157590

Int. Cl.³ C07C *45/35, 45/37*

U.S. Cl. 568—471 **6 Claims**

1. A process for producing methacrolein by a vapor phase catalytic oxidation of isobutylene or tertiary butanol which comprises reacting isobutylene or tertiary butanol with molecular oxygen or a molecular oxygen-containing gas in the vapor phase at 250° to 450° C. in the presence of a complex oxide catalyst having the formula

$$Mo_aCo_bFe_cBi_dTl_eX_fY_gZ_hO_i$$

wherein X represents V and/or Nb; Y represents La and/or Ce; and Z represents Cs and/or Te and a, b, c, d, e, f, g, h and i represent atomic ratios wherein a = 12; b = 3 to 15; c = 0.4 to 5; d = 0.4 to 5; e = 0.01 to 2; f = 0.01 to 2; g = 0 to 2; h = 0 to 2; and i is determined by the valences of the non-oxygen components of the catalyst and is in a range of 40 to 79.

4,250,340

PROCESS FOR PREPARING ARALKYL HALIDES

Philip J. McMahon, Wolverhampton, and Frank S. Yates, Brocton, both of England, assignors to Croda Synthetic Chemicals Limited, Four Ashes West Midlands, England

Filed Dec. 20, 1978, Ser. No. 971,470

Claims priority, application United Kingdom, Dec. 22, 1977, 53518/77

Int. Cl.³ C07C *41/22*

U.S. Cl. 568—639 **6 Claims**

1. A process for preparing a mixture of m-phenoxybenzyl chloride and m-phenoxybenzal chloride, which comprises reacting m-phenoxytoluene with, per mole thereof, from one to 2 moles of sulphuryl chloride in an excess of perchloroethylene solvent and in the presence of an alkyl peralkanoate initiator, said initiator having a half-life of 1 to 60 minutes at 115° to 123° C., the sulphuryl chloride being added portionwise or continuously to the m-phenoxytoluene during the course of the reaction, in which the initiator is added to the reaction mixture in amounts of from 1 to 4% at the start of the reaction and from 2 to 10% during the course of the reaction, the percentages being by weight based on the weight of m-phenoxytoluene, said reaction being carried out under substantially atmospheric pressure and at a temperature of at least 110° C.

4,250,341

2,2,6,6-TETRACHLORO (OR BROMO) CYCLOHEXANE AND PYROGALLOL

Brian J. Needham, and John Miller, both of Cambridge, England, assignors to Fisons Limited, London, England

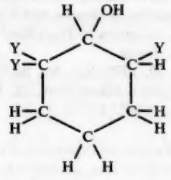
Filed Jul. 12, 1979, Ser. No. 56,973

Claims priority, application United Kingdom, Jul. 12, 1978, 29563/78

Int. Cl.[3] C07C *37/01, 37/02, 49/403*

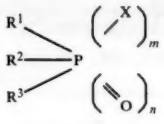
U.S. Cl. 568—361 10 Claims

1. A process for preparing 2,2,6,6-tetrachlorocyclohexanone or 2,2,6,6-tetrabromocyclohexanone, which comprises reacting in the liquid phase, in the case of the production of 2,2,6,6-tetrachlorocyclohexanone, chlorine, and in the case of the production of 2,2,6,6-tetrabromocyclohexanone, bromine, with a cyclohexanol compound of the formula



I

where each Y is the same or different and represents, in the case of the production of 2,2,6,6-tetrachlorocyclohexanone, an atom of hydrogen or chlorine, and in the case of the production of 2,2,6,6-tetrabromocyclohexanone, an atom of hydrogen or bromine, in the presence of as catalyst, an organophosphorus compound of the formula



II

where

X represents an atom of chlorine or bromine;

n is 0 or 1; and

when n is 0, m is 0 or 2, R^1 is alkyl of 1 to 10 carbon atoms or phenyl, and R^2 and R^3 are the same or different and are hydrogen, alkyl of 1 to 10 carbon atoms or phenyl; and

when n is 1, m is 0, and R^1, R^2 and R^3 are the same and each is

alkyl of 1 to 10 carbon atoms or phenyl, or R^1 is hydrogen and R^2 and R^3 are the same or different and each is alkyl of 1 to 10 carbon atoms or phenyl;

or a salt of said organophosphorus compound.

10. A process for preparing pyrogallol or a salt thereof, which comprises carrying out the process according to claim 1, and hydrolysing the 2,2,6,6-tetrachlorocyclohexanone or 2,2,6,6-tetrabromocyclohexanone.

4,250,342

2-OXABICYCLOOCTANE DERIVATIVES, PROCESSES FOR PREPARING SAME AND ORGANOLEPTIC USES THEREOF

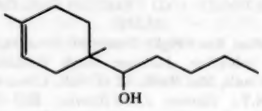
Mark A. Sprecker, Sea Bright; Frederick L. Schmitt, Holmdel; Manfred H. Vock, Locust; Joaquin F. Vinals, Red Bank, all of N.J., and Jacob Kiwala, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 48,752, Jun. 15, 1979, which is a division of Ser. No. 12,695, Feb. 16, 1979, Pat. No. 4,195,100, which is a continuation-in-part of Ser. No. 953,128, Oct. 20, 1978, Pat. No. 4,195,099. This application Nov. 16, 1979, Ser. No. 95,146

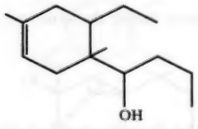
Int. Cl.[3] C07C *33/14*

U.S. Cl. 568—826 5 Claims

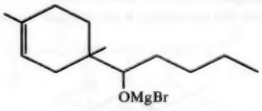
1. The compound having the structure



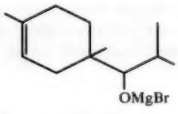
2. The compound having the structure:



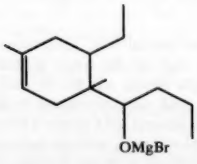
3. The compound having the structure:



4. The compound having the structure:



5. The compound having the structure:



4,250,343

PROCESS FOR THE PREPARATION OF PURE α,ω-C_6- TO C_{20}-ALKENOLS

Manfred Kaufhold, Marl, and Werner Jacquemin, Haltern, both of Fed. Rep. of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jan. 31, 1980, Ser. No. 117,322

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1979, 2904518

Int. Cl.³ C07C *29/60, 33/025*

U.S. Cl. 568—903 **7 Claims**

1. A process for preparing an α,ω-C_6- to -C_{20}-alkenol of a purity of greater than 85% comprising catalytically dehydrating the corresponding α,ω-C_6- to -C_{20}-diol using a catalyst of a neutral pyrophosphate of lithium, sodium, strontium or barium or a mixture thereof at a temperature of 300°-500° and a diol conversion of 10–90%.

4,250,344

CRACKING PROCESS FOR STYRENE

Martin B. Sherwin, London, England; Jimmy Y. Peress, West Haven, Conn., and Kenneth J. Gwozdz, Pompton Plains, N.J., assignors to Chem Systems Inc., New York, N.Y.

Filed Oct. 25, 1978, Ser. No. 954,330

Int. Cl.³ C07C *1/20*

U.S. Cl. 585—437 **8 Claims**

1. In a process for preparing styrene by the cracking of beta-phenethyl ester, the improvement of feeding to said cracking step from 1 to 20 wt. % of beta-phenethyl alcohol in admixture with said beta-phenethyl ester.

4,250,345

SELECTIVE PRODUCTION OF PARA-XYLENE

Chin-Chiun Chu, South Plainfield, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Jan. 10, 1978, Ser. No. 868,255

Int. Cl.³ C07C *2/68*

U.S. Cl. 585—467 **11 Claims**

1. A process for the selective production of para-xylene which comprises reacting toluene with a methylating agent under methylation conditions in the presence of a catalyst comprising a crystalline aluminosilicate zeolite, said zeolite having a silica to alumina ratio of at least about 12, a constraint index within the approximate range of 1 to 12, said catalyst having been modified by the addition thereto of phosphorus oxide and magnesium oxide as a result of incorporation of a compound of phosphorus and a compound of magnesium with said zeolite, each of said oxides being incorporated by impregnation of said zeolite therewith and being present in an amount of at least about 0.25 percent by weight.

4,250,346

LOW TEMPERATURE OXYDEHYDROGENATION OF ETHANE TO ETHYLENE

Frank G. Young, and Erlind M. Thorsteinson, both of Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 618,836, Oct. 1, 1975, abandoned. This application Apr. 14, 1980, Ser. No. 139,965

Int. Cl.³ C07B *5/48*

U.S. Cl. 585—658 **16 Claims**

1. A low temperature process for converting ethane to ethylene which comprises catalytically oxydehydrogenating ethane exothermically at a temperature of 450° C. or less in the gas phase in which the catalyst is a calcined composition containing the elements of Mo, X, and Y in the ratio:

$$Mo_aX_bY_c$$

wherein X is at least one of the groups V, Nb and Mn; V and W; V and Mn; or W and Nb.

Y is selected from the group consisting of Bi, Ce, Co, Cu, Fe, K, Mg, Ni, P, Pb, Sb, Si, Sn, Tl and/or U,

a is 1

b is 0.05 to 1

c is 0 to 2

with the proviso that the total value of c for Fe, Co and/or Ni is less than 0.5.

3. A process for the catalytic oxydehydrogenation of ethane to ethylene exothermically in the gas phase at a temperature of 550° C. or less by contacting the ethane under such conditions with a calcined catalyst comprising Mo, V, Nb and one additional element of the group Cu, Ce, Mn and U.

4,250,347

METHOD OF ENCAPSULATING MICROELECTRONIC ELEMENTS

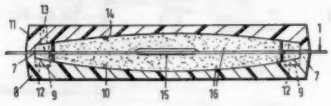
Richardus H. J. Fierkens, Keurbeek 15, Herwen, Netherlands

Filed Apr. 24, 1978, Ser. No. 899,340

Claims priority, application Netherlands, May 5, 1977, 7704937

Int. Cl.[3] H05K *5/00*

U.S. Cl. 174—52 PE 5 Claims



1. A method of producing encapsulated microelectronic elements each having wire leads, said method comprising the steps of: providing a strip composed of plural segments each of which has multiple conductors thereon; applying a microelectronic element to each of said segments and connecting said wire leads of each of said elements to selected ones of said conductors in the segment to which the microelectronic element is applied; detachably affixing first and second, prefabricated, cavitied members to each other on opposite sides of each segment in face-to-face relationship to form an envelope receiving the microelectronic element on the segment and also the portions of said conductors that are connected to the wire leads of the microelectronic element on the segment, such that (a) the assembly of (i) the microelectronic element, (ii) the lead wires of the microelectronic element, and (iii) said portions of the conductors on the segment is suspended in said envelope in spaced relation from the interior wall surfaces of said envelope and (b) the terminal ends of the conductors on the segment protrude from said envelope, subsequently both encapsulating said assembly and permanently affixing the pair of cavitated, envelope-forming members to their associated segment and to each other by (a) introducing a moldable synthetic material into said envelope to fill said envelope in peripheral surrounding relation to said assembly and (b) curing the moldable synthetic material in said envelope.

4,250,348

CLAMPING DEVICE FOR CABLES AND THE LIKE

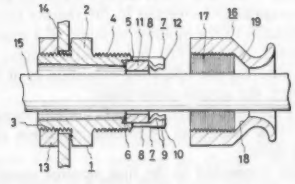
Hiroji Kitagawa, Nagoya, Japan, assignor to Kitagawa Industries Co., Ltd., Nagoya, Japan

Filed Dec. 29, 1978, Ser. No. 974,226

Claims priority, application Japan, Jan. 26, 1978, 53-8323[U]

Int. Cl.[3] F16L *21/02*

U.S. Cl. 174—65 SS 12 Claims



1. A locking device comprising essentially a hollow cylindrical body having a male screw formed about the outer periphery thereof and a clamping pipe having about the inner circumferential face thereof a female screw engageable with said male screw of the cylindrical body,

said cylindrical body having a plurality of annularly arranged independent gripping pieces projected from one side end of the body,

said gripping pieces including notched portions formed about the inner circumferential face of their portions excluding the top end portion to form elastic leg portions;

said elastic leg portions receiving a packing pipe fitted in the notched portion thereof, the respective ends of said packing pipe abutting onto the respective side walls of said notched portion of the gripping pieces,

said gripping pieces further having about the outer periphery at the top end portion thereof means for stopping and fixing the clamping pipe in the direction opposite to the lead direction of the male screw of the cylindrical body comprising a notch in the outer circumferential surface of each elastic leg portion,

said clamping pipe being formed about the inner circumference of one end portion thereof with a tapered portion to which the outer periphery of the top end portion of each gripping piece abuts, and having at said tapered portion at least one wedge-shaped member engageable with said notches on the gripping pieces in a ratchet-like manner,

wherein the clamping pipe is applied from the top end of the gripping pieces of the cylindrical body and threadably engaged with the cylindrical body, whereby top end portions of gripping pieces are pressed radially toward the center of the locking device to cause the packing pipe to undergo deformation to decrease in its diametral size, said top end portions being sized and spaced so as not to overlap each other,

an annular groove being formed at the side end portion of said notched portion and extending toward the cylindrical body, said annular groove being empty before deformation of said packing pipe and receiving therein an end portion of said packing pipe as the pipe undergoes deformation to decrease its diametral size.

4,250,349

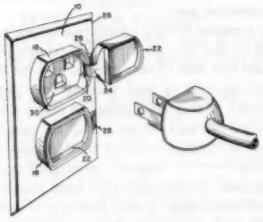
DRAFT/FREE SAFETY ENCLOSURE

Robert A. Bennett, 170 Sturbridge Rd., Easton, Conn. 06425

Filed Feb. 11, 1980, Ser. No. 120,639

Int. Cl.[3] H02G *3/14*

U.S. Cl. 174—67 5 Claims



1. A device adapted for use with an electrical outlet mounted in a suitable support and having the dual function when the outlet is not in use of preventing drafts of air from flowing through the outlet and blocking accidental access to the outlet, said device comprising:

a relatively flat member having a rear surface adapted to be secured to said support and an exposed front surface, said member having an aperture adapted to overlie and expose the outlet, said aperture having a peripheral wall extending between said rear and front surfaces, the wall having an opening which extends in depth from the rear surface to a position intermediate the front and rear surfaces and which has a uniform width, the member having an outer periphery, a portion of said periphery being disposed adjacent said opening;

a cover adapted for removable sealing engagement with said aperture and disposed adjacent said front surface, said cover engaging said peripheral wall when sealing said aperture; and

a thin flexible ribbon of uniform width, the opening being

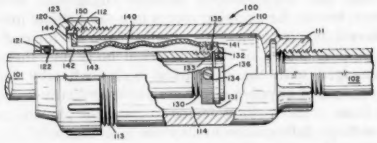
wider than said ribbon, said ribbon passing through said opening between said peripheral portion of the outer periphery and said cover, one end of said ribbon being secured to said peripheral portion, the other end of the ribbon being secured to the outer periphery of said cover.

4,250,350

EXPANSION JOINT WITH INTERIOR GROUNDING CONTINUITY BOND

Robert F. Polimine, Lynbrook, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Filed Sep. 24, 1979, Ser. No. 78,261
Int. Cl.³ H02G *15/08*
U.S. Cl. 174—86 **8 Claims**



1. An electrical fitting expansion joint having high integrity grounding continuity and comprising in combination:

(a) a body member having first and second ends and having a through longitudinal interior opening and provided with means for coupling said first end of said body member to another member with electrical continuity therebetween;

(b) a conduit bushing sized to fit within said interior opening of said body member;

(c) a longitudinal, flexible conductor having first and second ends with said first end coupled to said conduit bushing;

(d) a rigid and generally "L" shaped ferrule like member coupled to said second end of said flexible conductor;

(e) a washer having a first side in cooperative relationship with said ferrule like member and sized so that a second side will concurrently mate with said second end of said body member; and

(f) a head member having an internal shoulder for contacting one leg of said ferrule member and pressing it in contact with said first side of said washer and for thereby pressing said second side of said washer into contact with said second end of said body member when said head member is coupled to said second end of said body member; whereby a conduit coupled to said conduit bushing and extending from the interior opening of said body member through said washer and said head member would have electrical continuity to said first end of said body member with the path extending from said first end of said body member to said second end of said body member to said washer to said ferrule to said flexible conductor coupled to said conduit bushing.

4,250,351

CABLE CONSTRUCTION

Robert M. Bridges, Northridge, Calif., assignor to The Bendix Corporation, North Hollywood, Calif.

Filed Aug. 8, 1979, Ser. No. 64,926
Int. Cl.³ H01B *7/14*
U.S. Cl. 174—106 R **10 Claims**

1. An electrical cable comprising

a center rod of nonconducting material and a plurality of conducting wires wrapped around said rod in a helix angle;

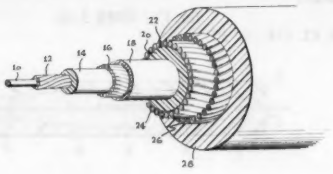
a layer of polypropylene insulation surrounding and enclosing said conducting wires,

a layer of fine conducting wires spiraled over the surface of said polypropylene insulation in a helix angle and a wrap over said fine conducting wires of copper-polyester film tape with the copper layer thereof adjacent said wires;

a layer of polyvinylchloride insulation covering said wrap,

a bedding layer of light braided polyester fiber covering said polyvinylchloride insulation layer,

a first layer of steel armor wires wrapped in a helical angle over said bedding layer,



a second layer of steel armor wires wrapped in a helical angle over said first layer but wrapped in the opposite direction to effect torque balancing, said armor wires being spaced slightly from each other, and

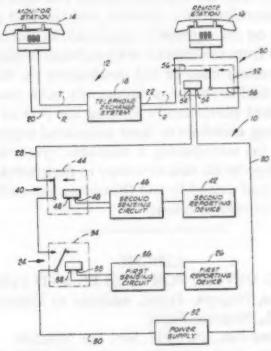
an external jacket of polyurethane insulation material pressure-extruded over said armor wires.

4,250,352

REMOTE STATION MONITORING SYSTEM

William S. Workman, Sr., P.O. Box 464, Sentinel, Okla. 73664

Filed May 10, 1979, Ser. No. 37,695
Int. Cl.³ H04M *11/04*
U.S. Cl. 179—2 A **16 Claims**



1. In combination with a telecommunication system establishing signal transmission between a monitor terminal and a remote terminal, wherein a status inquiry signal originating at the monitor terminal and directed to the remote terminal results in transmission to the monitor terminal of a return signal having a selected one of a first mode and a second mode, a system for monitoring the operating condition of at least one reporting device, the system comprising:

first monitor means for originating a first alarm signal for the duration of a change in operating condition of a first reporting device;

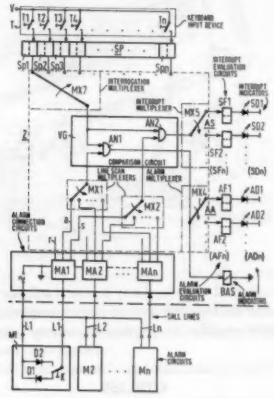
timing means connected to the first monitor means for receiving the first alarm signal and undergoing a transition to a de-energized state in response to the reception of the first alarm signal for a time period in excess of a preselected time limit; and

return signal control means connected to the remote terminal for controlling the mode of the return signal, wherein the return signal control means is connected to the timing means so as to be conditioned by the state of the timing means to transmit return signals in the second mode thereof at such times that the timing means is in the de-energized state thereof.

4,250,353
DANGER ALARM SYSTEM

Karlheinz Schreyer, Wolfratshausen, and Karla Oberstein, Neuried, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 13, 1979, Ser. No. 29,834
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1978, 2817090
Int. Cl.³ H04M *11/04*
U.S. Cl. 179—5 R 10 Claims



1. A danger alarm system comprising:

a plurality of call lines for calling signals;

a plurality of alarm circuits connected to respective call lines and operable to provide environment condition signals to said lines; and

a central exchange connected to said call lines, said central exchange including

a plurality of alarm connection circuits connected to respective call lines and each having three outputs and each operable to provide signals including alarm and line interrupt signals in response to the environmental signals,

a write-read memory including a plurality of storage locations each including an input and an output and each assigned to store the busy or non-busy state of a respective line,

a plurality of synchronously operable multiplexers,

first and second ones of said multiplexers connected to read said first and second outputs, respectively, of said plurality of alarm connection circuits,

a third one of said mulitiplexers connected as an interrogation multiplexer to said outputs of said memory,

a comparison circuit connected between said third, interrogation multiplexer and said first and second multiplexers and operable to compare alarm and interrupt signals with the busy status of the respective call lines and responsive to a busy state in conjunction with an alarm signal to produce an alarm output signal and responsive to a busy state in conjunction with an interrupt signal to produce an interrupt output signal,

alarm evaluation circuits operable in response to alarm output signals,

interrupt evaluation circuits operable in response to interrupt output signals,

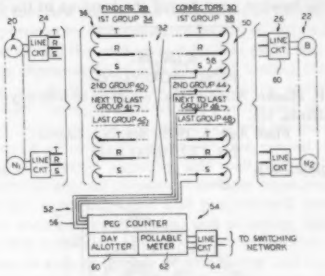
a fourth multiplexer connected as an alarm multiplexer between said comparison circuit and said alarm evaluation circuits, and

a fifth multiplexer connected as an interrupt multiplexer between said comparison circuit and said interrupt evaluation circuits.

4,250,354
TELEPHONE DAY COUNT TRAFFIC OBSERVING AND DATA ACCUMULATING EQUIPMENT

Ernest C. Karras, 18 W. 772 Ave. Chateaux N., Oak Brook, Ill. 60521

Filed Nov. 1, 1976, Ser. No. 737,210
Int. Cl.³ H04M *15/22*
U.S. Cl. 179—8 A 10 Claims



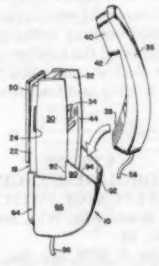
1. A day count traffic observing and data accumulating device comprising group observing means responsive to busy signals at each of a plurality of observed equipments formed into groups for storing a memory of traffic conditions through said groups of equipment, means for concentrating the observed traffic conditions at said groups of equipment into a bulk tally, and means for distributing said tally on a daily basis, whereby said tally provides a day count allotting of traffic through all of said equipments.

4,250,355
Patent Not Issued For This Number

4,250,356
TELEPHONE CRADLE

Victor S. Hammer, Jr., Lake Zurich, and E. Grant Swick, Bartlett, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Jun. 1, 1979, Ser. No. 44,441
Int. Cl.³ H04M *1/04*
U.S. Cl. 179—146 R 10 Claims



1. A one-piece plastic handset cradle attachment for a wall mounted telephone having a base panel and housing, said cradle including a bottom with front, back and sidewalls extending upwardly therefrom, slot means in said front and back walls, said panel, said base panel of said telephone having at least a portion thereof spaced from said wall, said back wall of said cradle having a portion thereof adapted to underlie said telephone base panel, said back wall of said cradle being stepped and contoured to embrace the telephone and back panel, integral retaining means adapted to cooperate with said base panel for retention of said cradle, the stepped portion of

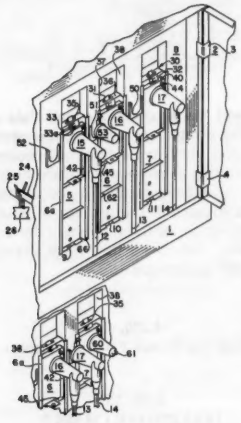
said back wall carries said retaining means which include a plurality of protuberance means complementary to and acceptable within apertures in said back panel, said cradle being resiliently expandible to permit mounting thereof on said telephone, said back wall slot being substantially wider than said front wall slot, said side and front walls in mounted position extending forwardly of said telephone housing and contoured interiorly to accept one end of said handset, and means for guiding the handset cord during the hand-up of the handset.

4,250,357

FUSE MOUNTING

Kenneth E. Hanke, Atlanta, Ga., assignor to Kearney-National, Inc., Atlanta, Ga.

Filed Aug. 6, 1979, Ser. No. 63,942
Int. Cl.[3] H01H *9/22*
U.S. Cl. 200—50 A **16 Claims**



1. A fuse mounting comprising a housing, a hingedly mounted fuse panel disposed within said housing and normally forming a part of a fuse isolating wall within said housing, fuse mounting means secured to the interior of said fuse panel, conducting means secured to and extending through said fuse panel and arranged for connection with one terminal of a fuse mounted on said fuse mounting means, disjointable connecting means exteriorly of said isolating wall engageable with a part of said conducting means on the exterior of said fuse panel for forming a removable electric connection therewith, and movable latch means for holding said fuse panel in its normal position.

4,250,358

CONTROL UNIT FOR MARINE ENGINES EMPLOYING SAFETY STOP SWITCH

Gary G. Gilbertson, Brownsville, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Mar. 9, 1979, Ser. No. 19,173
Int. Cl.[3] H01H *3/14*
U.S. Cl. 200—52 R **7 Claims**

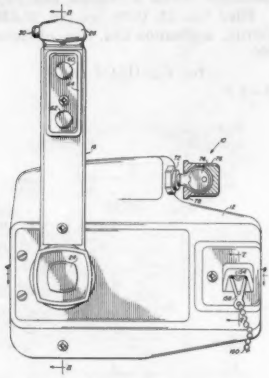
1. A safety stop switch assembly for an engine control unit, comprising:

(a) a control unit housing;

(b) a normally closed switch for electrical connection to an engine to interrupt engine operation when switched to an open position, said normally closed switch being mounted on said housing and including a switch arm extending away from said housing to permit operation of said switch between closed and open positions;

(c) a key encircling said switch arm;

(d) means restricting removal of said key from said switch arm while in said closed position and allowing removal of said key from said switch arm while in said opening position; and



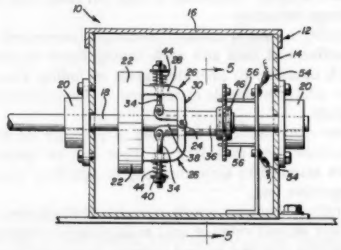
(e) means coupled with said key to exert a force through said key against said switch arm to thereby operate said switch to the open position and remove said key from said switch arm.

4,250,359

SPEED SENSOR SWITCH

George G. Gdovichin, Ebensburg, Pa., assignor to JAB Company, Incorporated, Ebensburg, Pa.

Filed Jun. 15, 1979, Ser. No. 48,997
Int. Cl.[3] H01H *35/10*
U.S. Cl. 200—80 R **9 Claims**

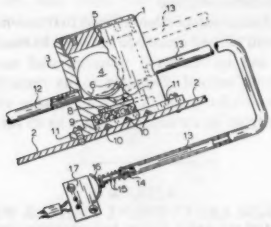


6. A speed responsive switch mechanism comprising: a rotatable shaft; a plurality of flyweights, each flyweight being connected to a support arm, each said support arm being pivotally connected to said shaft; a sleeve means disposed upon said shaft for axial movement along said shaft; movable contacts disposed upon said sleeve means; stationary contacts aligned with said movable contacts; and resilient means connected between said support arm and said sleeve means for causing axial movement of said sleeve means upon outward displacement of said flyweights; wherein said resilient means includes at least one control arm for each support arm, each said control arm being pivotally attached to said sleeve means and having a free end which passes through an aperture formed in a respective one of said support arms; a spring means mounted between each said free end and each said support arm for biasing said flyweight toward said shaft; wherein said movable contacts are mounted upon the outer race of a bearing member, said bearing member having an inner race mounted on said sleeve means; and further including a pin means extending from said stationary contacts for inhibiting rotary motion of said movable contacts.

4,250,360
DEVICE TO AUTOMATICALLY ACTIVATE OR DEACTIVATE CONTROL MEANS

Gustav E. Svensson, Villa Solhäll, Holm, Sweden (310 33)

Filed Jan. 5, 1978, Ser. No. 867,018
Int. Cl.[3] F15B *13/04;* H01H *35/38*
U.S. Cl. 200—82 C 5 Claims



1. A device designed to effect automatic activation or deactivation of electrically, hydraulically, or pneumatically operated control means, comprising:

an air-tight housing having a chamber therein;

a free-moving body positioned within said chamber with lateral clearance;

an aperture within said chamber and positioned at the bottom of said chamber, said aperture in communication with the ambient atmosphere;

a first conduit interconnecting said chamber and a source of pressure;

a second conduit having one end connected to said chamber and an opposite end closed by a pressure responsive control member, said control member arranged for displacement in said second conduit against the action of at least one spring means, said first and second conduits in permanent communication with said chamber;

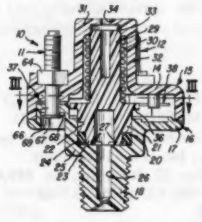
said free-moving body arranged, in a normal position, to be sealingly seated above said aperture blocking same, but upon inclination of said housing past a certain tilting angle or upon a predetermined magnitude of acceleration or retardation of said housing, to be displaced laterally from its sealing position above said aperture opening same;

said spring means arranged, upon movement of said free-moving body from its normal position, to cause said control member to affect a process.

4,250,361
PRESSURE ACTUATED SWITCH WITH ACTUATOR HAVING CONTACT-ACTUATING RIB BETWEEN PISTON AND SPRING-GUIDE PORTIONS

Harold A. Dvorachek, Iola, Kans., assignor to The Echlin Manufacturing Company, Branford, Conn.

Filed Mar. 12, 1979, Ser. No. 19,766
Int. Cl.[3] H01H *35/38*
U.S. Cl. 200—82 R 9 Claims

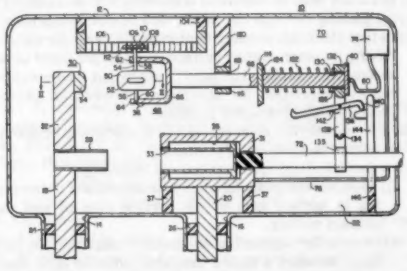


1. In a pressure actuated switch, housing means having a central axis and including first and second planar support surface portions disposed approximately in a common plane transverse to said central axis and disposed in radially spaced relation to said axis and in arcuately spaced relation to each other, first and second resilient contact plates having portions engaged with said first and second support surface portions and having overlapping end portions, first and second interengageable contacts on said overlapping end portions of said first and second contact plates, an actuating member supported for axial movement in said housing means, said actuating member and one of said first and second contact plates having interengageable portions for controlling deflection of the end portion of said one of said first and second contact plates and thereby controlling engagement of said first and second contacts in response to axial movement of said actuating member, said housing means having a first end wall portion and an opposite second end wall portion, each of said first and second end wall portions being generally transverse to said central axis, said housing means further including side wall portions defining first and second internal cylindrical surfaces respectively adjacent said first and second end wall portions and having axes coincident with said central axis, said actuating member including a first cylindrical portion quided by said first cylindrical surface, an annular surface portion facing said second end wall portion and a second cylindrical portion extending away from said annular surface and within said second cylindrical surface, and a coiled compression spring engaged between said annular surface and said second end wall and disposed in surrounding relation to said second cylindrical portion of said actuating member and within said second cylindrical surface of said housing means, said actuating member further having a rib portion extending radially outwardly with respect to said annular surface portion, and said one of said contact plates having a tab portion extending radially inwardly for engagement with said radially outwardly extending rib portion of said actuating member.

4,250,362
CIRCUIT INTERRUPTER UTILIZING A CLOSING RESISTANCE

Alan H. Cookson, Southboro, Mass., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 8, 1978, Ser. No. 967,830
Int. Cl.[3] H01H *33/16*
U.S. Cl. 200—144 AP 6 Claims



1. A circuit interrupter for energizing a line comprising:

stationary main contact means;

a movable main contact operable between open and closed positions with respect to said stationary main contact means;

means defining a stationary impedance contact electrically connected to said stationary main contact means;

a resistance electrically connected to said movable means contact;

a movable, rotatable impedance contact electrically connected to said resistance and operable between open and closed positions with respect to said stationary impedance

contact, said movable impedance contact having a projection extending outwardly therefrom, said movable impedance contact and said stationary impedance contact, when in said open position, having a substantially uniform electric field distribution therebetween, said movable impedance contact, upon moving towards said closed position with respect to said stationary impedance contact, rotating and causing said projection to extend into the electric field between said stationary and movable impedance contacts causing said electric field distribution therebetween to become non-uniform; and

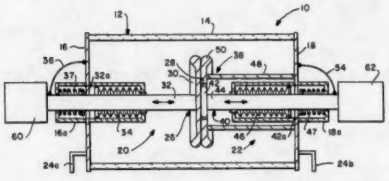
movement effecting means for effecting movement of said movable main contact between said open and closed positions with respect to said stationary main contact means and for effecting rotation and movement of said movable impedance contact between said open and closed positions with respect to said stationary impedance contacts, said movement effecting means effecting movement of said movable impedance contact such that said movable impedance contact is in said closed position with respect to said stationary impedance contact prior to said movable main contact being in said closed position with respect to said stationary main contact means.

4,250,363

ELECTRICAL CIRCUIT BREAKING DEVICE AND METHOD

Joachim V. R. Heberlein, Pittsburgh, and Francis A. Holmes, Monroeville, both of Pa., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Dec. 6, 1978, Ser. No. 967,080
Int. Cl.³ H01H *33/66*
U.S. Cl. 200—144 B **10 Claims**



1. An electrical circuit breaking device adapted for connection in circuit with an electrical conductor for interrupting the current passing through the latter, said device comprising:

(a) a first electrode arrangement including a single electrode having an inner contact surface and a larger outer contact surface surrounding the inner surface and means supporting said electrode for movement between an extended position and a retracted position;

(b) first means for moving said first electrode between its extended and retracted positions;

(c) a second electrode arrangement including

(i) a second electrode havng a contact surface corresponding in surface area to the surface area of said inner contact surface,

(ii) means for supporting said second electrode for movement between a biased extended position such that its contact surface is in physical contact with said inner surface of said single electrode regardless of the position of said single electrode and a retracted position out of contact with said inner contact surface when said single electrode is in its retracted position,

(iii) a third electrode having a circumferential contact surface which is spaced outwardly from and which circumscribes said second electrode contact surface, said third electrode contact surface corresponding in surface area to the surface area of said outer contact surface of said single electrode,

(iv) means for supporting said third electrode in a fixed position such that its contact surface is in physical contact with said outer contact surface of said single electrode when the latter is in its extended position and such that its contact surface is out of physical contact with said outer contact surface when said single electrode is in its retracted position, and

(v) means for electrically connecting said second and third electrodes together regardless of the position of said second electrode; and

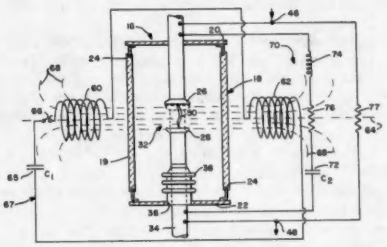
(d) second means independent of said first moving means for moving said second electrode between its biased extended position and its retracted position, said second means moving said second electrode to its retracted position from its extended position after movement of said single electrode from its extended position to its retracted position.

4,250,364

VACUUM ARC CURRENT LIMITER WITH OSCILLATING TRANSVERSE MAGNETIC FIELD AND METHOD

Clive W. Kimblin, Pittsburgh; Francis A. Holmes, Monroeville Borough; Joachim V. R. Heberlein, Pittsburgh; Joseph G. Gorman, Franklin Township; Westmoreland County, and Paul G. Slade, Pittsburgh, all of Pa., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Oct. 13, 1978, Ser. No. 951,070
Int. Cl.³ H01H *33/66*
U.S. Cl. 200—144 B **7 Claims**



1. A vacuum arc current interruption device comprising: an evacuated envelope, a pair of electrodes supported in said envelope for relative movement between a closed position in which said electrodes are in mutual contact and an open position in which said electrodes are separated to define an arc gap there-between, arcing in said arc gap occurring along an arcing path between said electrodes as said electrodes are moved from a closed position to an open position when said electrodes are separated, magnetic means for producing an oscillatory magnetic field in said arc gap transverse to said arcing path and for producing an oscillatory arc voltage, and resonant circuit means connected between said electrodes in parallel with said arc gap and responsive to said oscillatory arc voltage to produce an oscillatory arc current whereby said arc tends to be extinguished when said current approaches zero.

4,250,365

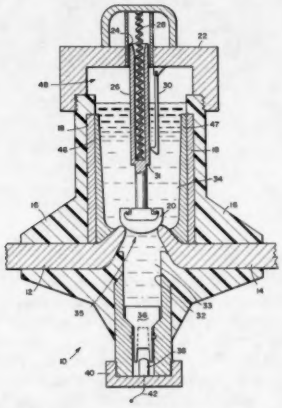
CURRENT INTERRUPTER FOR FAULT CURRENT LIMITER AND METHOD

Lorne D. McConnell, Chalfont, Pa., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Mar. 22, 1978, Ser. No. 889,491
Int. Cl.³ H01H *33/68*
U.S. Cl. 200—150 R **9 Claims**

1. A current interrupter for use in controlling current associated with power line faults comprising: a housing, a pair of electrode members fixed in spaced relation in said housing, a contact member supported in said housing for movement be-

tween closed and open positions, said contact member being electrically interconnected with one of said pair of electrode members at all times and being in electrical contact with the other of said pair of electrode members when in said closed position and spaced from said other of said pair of electrode members when in said open position, a third electrode member fixed in said housing and spaced from both said pair of electrode members, said contact member being spaced from said third electrode member when in said closed position and being in electrical contact with said third electrode member to inter-



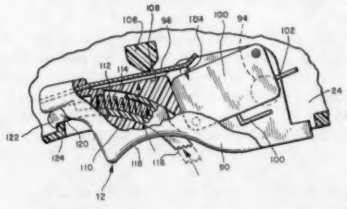
connect said third electrode member with said one of said pair of electrode members when in said open position, a chamber in the interior of said housing for holding a dielectric fluid, a passage between said chamber and the interior of said housing, said contact member blocking and closing said passage when in said closed position, and means in said housing for rapidly incresing fluid pressure in said chamber to force escape of said dielectric fluid through said passage and thereby move said contact member from said closed position to said open position by means of fluid pressure.

4,250,366

TRIGGER ASSEMBLY FOR ARC WELDING GUN

Milton W. Erickson, Crete, and Donald M. White, III, Hazel Crest, both of Ill., assignors to Dover Corporation, New York, N.Y.

Filed Mar. 30, 1979, Ser. No. 25,570
Int. Cl.³ H01H *9/06*
U.S. Cl. 200—157 **19 Claims**



1. A trigger assembly for an arc welding gun, said trigger assembly comprising:

a trigger housing defining a finger surface;

means for pivotably mounting the trigger housing to the welding gun such that the trigger housing is movable between a rest position and an actuated position;

a switch mounted inside the trigger housing;

means for actuating the switch in response to movement of the trigger housing from the rest position to the actuated position; and

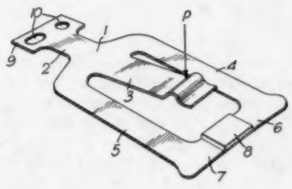
means for releasably locking the trigger housing in the actuated position, said locking means comprising a locking crescent slideably mounted in the trigger housing, said crescent having a first end section positioned adjacent the finger surface of the trigger and a second end section defining a locking surface for engaging the welding gun, said locking crescent positioned such that pressure on the first end section both pivots the trigger housing into and locks the trigger housing in the actuated position.

4,250,367

SNAP ACTION SWITCH BLADES

Guglielmo Rossi, Stutensee-Friedrichstal, Fed. Rep. of Germany, assignor to Ranco Incorporated, Columbus, Ohio

Filed Jul. 14, 1978, Ser. No. 924,696
Int. Cl.³ H01H *5/22*
U.S. Cl. 200—275 **6 Claims**



1. A snap action switch blade of resilient sheet metal comprising a base portion, an inwardly projecting tongue, an outwardly projecting tongue, two resilient legs projecting from opposite sides of the base portion, said legs terminating beyond the inwardly projecting tongue and merging in respective resiliently deflectable arms which project laterally inwardly towards each other, and a contact element affixed to and interconnecting laterally inwardly projecting end portions of the arms, said contact element drawing said arms toward each other to produce a dish deformation of said base portion predisposing the blade for snap movement of the contact when an operating force is applied to one of the tongues while the end of the other tongue is anchored.

4,250,368

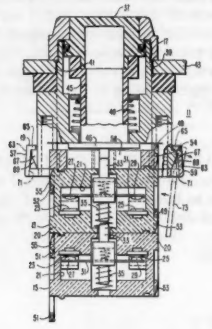
DETACHABLE SWITCH STRUCTURE

Robert J. Johnston, Patterson Heights; Stephen G. Layciak, Brighton Township, Beaver County, and Stephen S. Dobrosielski, Beaver, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 4, 1979, Ser. No. 45,448
Int. Cl.³ H01H *13/00*
U.S. Cl. 200—307 **3 Claims**

1. A detachable switch structure comprising an actuating unit, at least one switch detachably mounted on the unit, and an adapter for mounting the switch on the unit; the switch having a dielectric housing including opposite end, edge, and side walls forming a contact compartment, the switch having stationary and movable contacts, the switch also having movable contact operating means including a guided reciprocable plunger, the opposite end walls of the switch having plunger-receiving openings, the switch being detachably mounted on one side of the adapter; the unit comprising a tubular actuator having one end against the other side of the adapter, the unit having manual handle means extending from the other end of the casing to said one end; the adapter and actuating unit having releasable interfitting means comprising flexible hook members on the adapter releasably engaged with projections

on the unit, there being at least two hook members equally spaced around the periphery of the adapter, the hook members being the only moving parts of the interfitting means and being integral with the adapter; the projection having a beveled edge in line with the hook path of movement when the adapter is moved into interfitting position with the unit, the hook comprising an outturned portion extending from the adapter and a



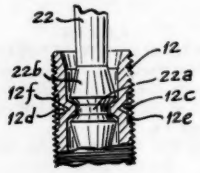
longitudinal portion extending from the outturned portion and spaced from the adapter and an inturned portion at the end of the longitudinal portion remote from the outturned portion, the inturned portion including a locking surface engaging the projection, and the outturned portion comprising aperture means for insertion of releasing tool means between the beveled edge and the longitudinal portion for flexing the hook members out of engagement with the locking surface.

4,250,369

FORMED PIVOT FOR TOGGLE LEVER AND METHOD OF MAKING

Robert E. Larkin, Sussex, and Earl T. Piber, Oconomowoc, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Mar. 15, 1979, Ser. No. 20,823
Int. Cl.³ H01H *3/04*
U.S. Cl. 200—339 **16 Claims**



1. In an electric switch or the like having a mounting bushing and a toggle lever, the improvement comprising pivot means mounting said toggle lever in said bushing to allow limited pivotal movement of said toggle lever in one plane while preventing said toggle lever from wobbling out of said plane as well as from being withdrawn from the bushing bore, said pivot means comprising:

an enlarged portion on said toggle lever within said bushing;

trunnion-receiving recess means in diametrically opposite sides of said enlarged portion of said toggle lever;

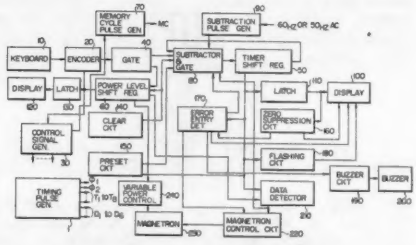
and rigid trunnions formed by inwardly offsetting diametrically opposite portions of the side walls of said bushing so as to extend into said recess means and pivot said toggle lever for limited movement in said one plane.

4,250,370

DIGITAL CONTROL FOR A COOKING TIME AND POWER OF AN ELECTRIC COOKING DEVICE

Masayuki Sasaki, and Shuichi Gotou, both of Kawasaki, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Continuation of Ser. No. 736,356, Oct. 27, 1976, abandoned. This application Aug. 23, 1978, Ser. No. 936,040
Claims priority, application Japan, Oct. 31, 1975, 50-132044
Int. Cl.³ H05B *6/68*
U.S. Cl. 219—10.55 B **21 Claims**



1. A digital control device for controlling cooking time and power of an electric cooking device comprising:

keyboard means having numeral keys, timer key, power level key and cook key;

entry means coupled to said keyboard means to generate in response to the depression of one of said numeral keys an output as a numerical data corresponding to the numerical value of the depressed key;

first shift register means coupled to the output of said entry means having a plurality of digit stages and adapted to store in response to the depression of said timer key and numerical keys a time data on a cooking time of said cooking device which corresponds to the numerical values of the depressed numeral keys;

second shift register means coupled to the output of said entry means to store in response to the depression of said power level key and numeral key a data on a power level of said cooking device which corresponds to the latter depressed numeral key;

digital display means coupled to said first and second shift register means to display the data stored in said first and second shift register means;

subtraction pulse generating means for generating a subtraction pulse for passage of each predetermined unit of time;

subtraction means coupled to said first shift register means and said subtraction pulse generating means and adapted to subtract, for each generated subtraction pulse, a predetermined number from the time data in said first shift register means in response to the depression of said cook key;

cooking device control means coupled to said first shift register means and adapted to operate said cooking device in response to the depression of said cook key after the storage in said first and second shift registers of data on the cooking time and power level and stop the operation of said cooking device when the data in said first shift register become a predetermined number through subtraction;

variable power control means coupled to said second shift register means and adapted to set said cooking device to a power corresponding to the data stored in said shift register means;

error entry detecting means for detecting whether the value of a time data entered by said entry means in said first shift register means is erroneous; and

means responsive to said error entry detecting means for (1) causing said display means to selectively flash only an erroneous digit or digits in said time data when said time

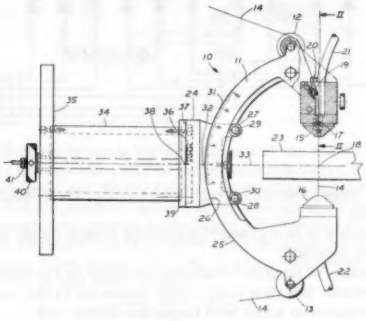
data in said first register means contains a digit or digits with erroneous values, and for (2) maintaining the constant display of any digit with a non-erroneous value.

4,250,371

ACCURATE PRODUCTION OF RELIEVED SHAPES BY ELECTRICAL EROSION

Edward W. Haug, and William C. Smith, both of Rockford, Ill., assignors to Barber-Colman Company, Rockford, Ill.

Filed Jan. 22, 1979, Ser. No. 5,271
Int. Cl.[3] B23P *1/14*
U.S. Cl. 219—69 W **11 Claims**



1. A method for producing a desired relieved shape from an electrically conductive workpiece by electrical erosion, said method comprising the steps of locating an upper surface of the workpiece in a substantially horizontal plane, tilting a wire electrode at a desired relief angle from vertical, passing an electric current between the workpiece and said electrode to erode material from the workpiece throughout a predetermined fixed working gap, and relatively moving said electrode and workpiece in such a manner as to maintain constant the perpendicular distance between said electrode and the outline of the relieved shape in the horizontal plane, said perpendicular distance being equal to said working gap.

4,250,372

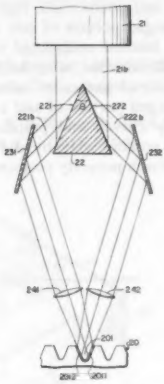
PROCESS AND APPARATUS FOR THE HEAT TREATMENT BY HIGH ENERGY BEAMS OF SURFACES OF STEEL PRODUCTS

Takayuki Tani, Osaka, Japan, assignor to Sumitomo Kinzoku Kogyo Kabushiki Gaisha, Osaka, Japan

Filed Jun. 18, 1979, Ser. No. 49,639
Claims priority, application Japan, Jul. 7, 1978, 53-83328
Int. Cl.[3] B23K *27/00, 15/00*
U.S. Cl. 219—121 LE **14 Claims**

1. A method for heat treating a substantially V-shaped steel surface of a steel product such as a gear or a rack, such V-shaped surface being defined by first and second flank surfaces substantially facing each other and inclined with respect to each other by a specific angle, said method comprising:

simultaneously projecting a first high energy beam against a first flank surface of a substantially V-shaped surface and projecting a second high energy beam against a second flank surface of said V-shaped surface, and thereby subjecting said first and second flank surfaces to heat treatment.

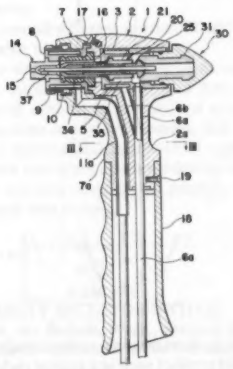


4,250,373

TRANSFERRED TYPE PLASMA TORCH

Hiroshi Tanida, No. 2-2, Habikigaokanishi 2-chome, Habikinoshi, Osaka, Japan (583)

Filed Jun. 15, 1979, Ser. No. 48,950
Claims priority, application Japan, Jun. 16, 1978, 53-73597
Int. Cl.[3] B23K *9/16*
U.S. Cl. 219—121 P **5 Claims**



1. A transferred type plasma torch having a multisection body, said sections being rigidly interconnectable to correctly position an electrode in said plasma torch body, said body comprising:

a middle body section having a central bushing provided with an internal constricted surface at its forward end and a collet attachment assembly mounted in said bushing, said collet attachment assembly holding an electrode;

a front body section having a nozzle tip disposed coaxially of said electrode;

a rear body section having a centrally bored end cap, said end cap having an internal countersunk forward end surface;

said collet attachment assembly comprising a cylindrical collet having a spherical flanged portion intermediate its ends and an internal conical surface at its forward end, and a collet chuck telescopingly carried in said collet with a

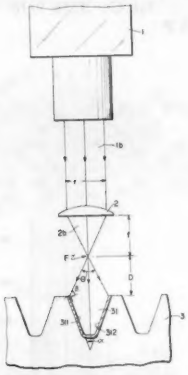
split conical forward tip end of said collet chuck engaging said internal conical surface of said cylindrical collet, and a spherical rear end portion of said collet chuck being received in said countersunk end of said end cap, said spherical flanged portion of said cylindrical collet contacting said internal constricted surface of said central bushing, said electrode being held in said collet chuck, said spherical end surface of said collet chuck and said spherical flanged portion of said cylindrical collet being cooperatively curved and positioned in said rear and middle body sections whereby said electrode is carried in said plasma torch properly positioned in said nozzle tip.

4,250,374

PROCESS AND APPARATUS FOR THE SURFACE HEAT TREATMENT OF STEEL PRODUCTS BY A LASER BEAM

Takayuki Tani, Osaka, Japan, assignor to Sumitomo Kinzoku Kogyo Kabushiki Gaisha, Osaka, Japan

Filed Jun. 18, 1979, Ser. No. 49,638
Claims priority, application Japan, Jul. 7, 1978, 53/83329
Int. Cl.³ B23K *27/00*
U.S. Cl. 219—121 LE **4 Claims**



1. A method for heat treating a substantially V-shaped steel surface of a steel product such as a gear or rack, such V-shaped surface being defined by first and second flank surfaces substantially facing each other and inclined with respect to each other by a specific angle, said method comprising:

directing a substantially parallel laser beam toward a substantially V-shaped steel surface including first and second flank surfaces;

providing a convex lens having a focal length (f) which meets the condition of $r/f \geqq 0.268$, wherein (r) is the diameter of said laser beam; and

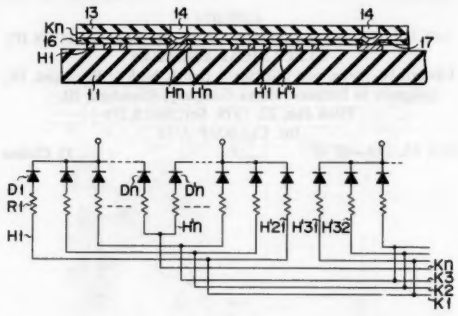
positioning said convex lens in the path of said laser beam such that the focal point of said convex lens is between said convex lens and said V-shaped surface, and such that said laser beam is diverged from said focal point and is projected against said first and second flank surfaces, thus subjecting said first and second flank surfaces to heat treatment.

4,250,375

THERMAL RECORDING HEAD

Tadashi Tsutsumi, Naritanishi, and Mamoru Mizuguchi, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 6, 1979, Ser. No. 45,933
Claims priority, application Japan, Jun. 14, 1978, 53-70740
Int. Cl.³ H05B *1/00*
U.S. Cl. 219—216 **4 Claims**



1. A thermal recording head which comprises an insulation substrate;

a plurality of heat-generating resistors formed on the insulation substrate;

a plurality of separate conductors mounted on the insulation substrate in a state respectively connected to the resistors connected in series with respective diodes; and

a conductor holder for supporting common conductor connected to the separate conductors, and wherein the conductor holder includes an insulation sheet, common conductors mounted on the insulation sheet in a state separated from each other at a prescribed interval, and an insulation layer deposited on the common conductors and provided with openings; said insulation sheet included in the conductor holder having windows aligned with the openings of the insulation layer; and the common conductors are connected to the separate conductor through the openings.

4,250,376

APPARATUS FOR RANGE FINDING EQUIPMENT

James D. Joseph, Oakdale, Minn., and Dennis J. Wilwerding, Littleton, Colo., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 20, 1979, Ser. No. 58,964
Int. Cl.³ G01J *1/36*
U.S. Cl. 250—204 **11 Claims**

1. Apparatus for use with an auto focus system which includes lens means that produces first and second radiation patterns of a scene, the patterns being similar and in a relative first condition when the lens means is in a proper focus position, in a relative second condition when the lens means is on a first side of the proper focus position and in a relative third condition when the lens means is on a second side of the proper focus position comprising, in combination;

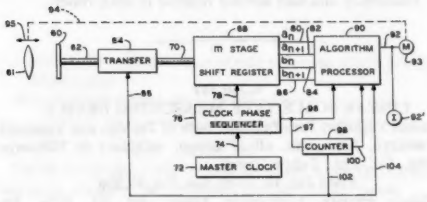
a first radiation detector positioned to receive radiation corresponding to a first position in the first pattern and to produce a first signal in accordance therewith;

a second radiation detector positioned to receive radiation corresponding to a second position in the first pattern and to produce a second signal in accordance therewith;

a third radiation detector positioned to receive radiation corresponding to a first position in the second pattern and to produce a third signal in accordance therewith;

a fourth radiation detector positioned to receive radiation corresponding to a second position in the second pattern and to produce a fourth signal in accordance therewith; and

signal receiving means connected to said first, second, third and fourth detectors to receive the first, second, third and fourth signals respectively therefrom and to produce a resultant signal representative of the absolute value of the



difference between the first signal and the fourth signal less the absolute value of the difference between the second signal and the third signal, the resultant signal having a first characteristic when the patterns are in the relative second condition and having a second characteristic when the patterns are in the relative third condition, as an indication of lens being on the first or second side respectively of the proper focus position.

4,250,377

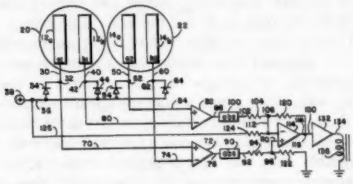
LOW CONTRAST BIAS AUTO FOCUS SYSTEM

Dennis J. Wilwerding, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 30, 1979, Ser. No. 99,235

Int. Cl.³ G01F *1/20*

U.S. Cl. 250—204 **8 Claims**



1. In apparatus for use in an auto focus system which produces an output signal that varies in magnitude with the position of a lens movable between first and second extremity positions and that receives radiation from a field of view containing an object to be focused upon, the output signal normally having a first characteristic when the lens is at the first extremity position, having a second characteristic when the lens is at the second extremity position and having a third characteristic when the lens is at a position corresponding to the focus position for the object, the magnitude of the signal decreasing under low contrast conditions in the scene so that the first and second characteristics approach the third characteristic thereby permitting a possible third characteristic to exist at other than the position corresponding to the focus position for the object, the improvement comprising:

bias means connected to the system and operable to change the output signal by a predetermined amount away from the first condition towards the second condition, the predetermined amount being chosen so that under low contrast conditions in the scene, the output signal is in the second condition when the lens is at the first extremity.

4,250,378

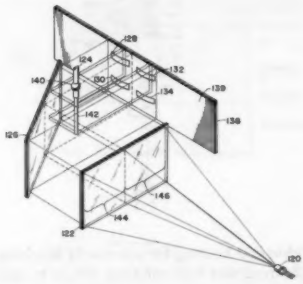
PHOTOELECTRIC JOYSTICK

Jon C. Mutton, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 6, 1978, Ser. No. 949,180

Int. Cl.³ G01V *9/04*

U.S. Cl. 250—221 **10 Claims**



1. A method of producing a digital representation of the relative position of a movable control stick comprising the steps of:

(a) providing a single source of illumination;

(b) providing a first and second array of light-sensitive elements out of the direct path of said illumination;

(c) directing a first portion of illumination from said source to said first array;

(d) directing a second different portion of said illumination from said source to said second array;

(e) positioning a single control stick so as to simultaneously shade a first selected element in said first array and a second selected element in said second array from said respective portions of said illumination; and

(f) generating a digital signal indicative of a particular said element in each said array that is shaded by said stick, said signal being representative of the position of said stick relative to each said array.

4,250,379

SAFETY SELECTOR SWITCH

James D. Hansen, Jr., Bothell, Wash., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 22, 1979, Ser. No. 68,789

Int. Cl.³ G01D *5/34;* **G05G** *1/08*

U.S. Cl. 250—229 **8 Claims**

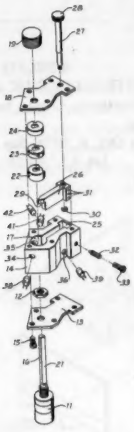
1. A locking device for an electrical component comprising,

a housing attached to a rotatable shaft of an electrical component,

a plurality of stop plates mounted on said rotatable shaft within said housing, each said stop plate having a cut-out portion in its periphery,

a second shaft slidably attached in said housing having an arm selectively positionable in said cut-out portions of said stop plates to limit rotation of said rotatable shaft, said cut-out portions in each stop plate being arranged to permit successive translations of said arm into cut-outs of adjacent stop plates after each stop plate has been rotated to a predetermined position,

light emitting means and light detecting means attached to said housing, and



means within said housing for selectively blocking and passing light from said light emitting means to said light detecting means.

4,250,380

ROTATION ANGLE DETECTOR

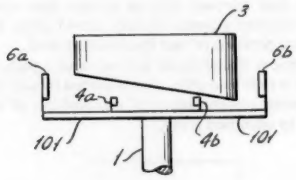
Motoi Iyeta, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Mar. 20, 1978, Ser. No. 888,475

Claims priority, application Japan, Mar. 31, 1977, 52/38709[U]

Int. Cl.³ G01D *5/34*; H02K *39/00*

U.S. Cl. 250—231 SE **12 Claims**



1. An improved rotation angle detector for detecting the rotational angular deviation of an object from a standard angular position about a selected axis, comprising:

an optical interceptor comprising a light-interceptive surface coaxial with said axis, the optical interceptive depth of said light-interceptive surface varying from position to position about said axis;

a photoelectric transducer comprising at least two photoelement systems, including a light source as one of said two photoelement systems and first and second light-receptive elements as the other of said two photoelement systems, said first and second light-receptive elements being angularly spaced apart about said axis, said optical interceptive depth varying with respect to the positions of said light-receptive elements such that upon relative rotation of said light-interceptive surface with respect to said light-receptive elements about said axis, the amount of light that passes from said light source to said light-receptive elements varies;

a main shaft co-rotatably coupled to said object, said photoelectric transducer being fixedly coupled to said main shaft;

means for rotating said optical interceptor and said photoelectric transducer relative to each other about said axis; and

comparator circuit means electrically coupled to and responsive to the outputs of said light-receptive elements for generating an output representative of the amount of light passing from said light source past said light-interceptive surface to said light-receptive elements which corresponds to said angular displacement of said photoelectric transducer and said surface relative to each other.

4,250,381

LINEAR SCALE TYPE MEASURING DEVICE

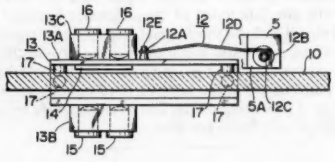
Katsushi Yoshiike; Toru Igarashi, both of Tochigi, and Yasuyuki Yamaryo, Kanagawa, all of Japan, assignors to Mitutoyo Mfg., Co., Ltd., Tokyo, Japan

Filed Jul. 16, 1979, Ser. No. 57,556

Claims priority, application Japan, Jul. 31, 1978, 53-105816[U]

Int. Cl.³ G01B *11/04*

U.S. Cl. 250—237 G **1 Claim**



1. A linear scale type measuring device wherein a fixed case has a linear scale provided therein and coupled thereto a slider which is slidably provided in the case, an index scale mounted on said slider is opposed to a linear scale, relative displacement of a movable member relative to said fixed case is imparted to said slider through connecting means and relative displacement between the linear scale and the index scale is read by use of a light source and a receptor both of which are provided on the slider in opposed relationship with the index and linear scales interposed thereinbetween, characterized in that said connecting means comprises a first engageable member provided at the forward end of a cantilever spring for biasing the slider towards the linear scale and a second engageable member engageable with said first engageable member, and said first engageable member comprises a triangular shaped ring formed in said forward end of said cantilever spring and said second engageable member comprises a frustoconical projection provided on said slider.

4,250,382

COAT DETECTION METHOD

Craig R. Libby, Gorham, Me., assignor to Scott Paper Company, Philadelphia, Pa.

Continuation of Ser. No. 888,013, Mar. 20, 1978, which is a continuation-in-part of Ser. No. 794,760, May 9, 1977. This application Aug. 14, 1979, Ser. No. 66,397

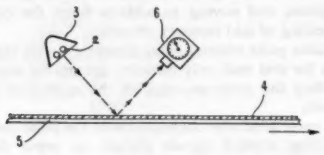
Int. Cl.³ G09K *3/00*

U.S. Cl. 250—302 **2 Claims**

1. A method of detecting a cured silicone coating applied to a paper substrate or the like in web form comprising:

adding an effective amount of a fluorescent pigment to the silicone coating formulation to be applied to the substrate;

applying the coating to the substrate;
curing the silicone coating;



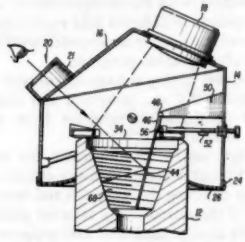
scanning the coated surface of said substrate with a UV light source; and
detecting the fluorescence of the coating.

4,250,383

THREAD INSPECTION APPARATUS AND METHOD

Burton L. Hewitt, 704 Oxford Dr., Laurel, Miss. 39440

Filed Sep. 14, 1979, Ser. No. 75,733
Int. Cl.³ G09K *3/00*
U.S. Cl. 250—302 **14 Claims**



1. Apparatus for inspecting threaded elements for flaws using radiant energy, especially the threaded box and pin ends of drill collars, drill tubing and other threaded tubular elements, comprising portable housing means for enclosing the threads to be inspected in a substantially light-excluding manner, said housing means including means cooperating with said threaded element for locating said housing means relative to said threaded element and for facilitating relative rotation therebetween, a source of ultraviolet energy supported by said housing means and oriented to direct ultraviolet energy upon the threads to be inspected, said housing means further including an inspection aperture through which the threads to be inspected are visually observed, said aperture having a field of view within the housing means.

4,250,384

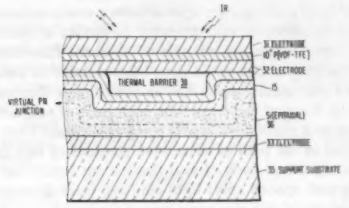
RADIANT ENERGY SYSTEMS, MEMORIES AND THERMAL IMAGING METHODS AND APPARATUS

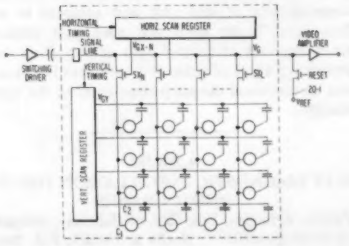
Charles F. Pulvari, 2014 Taylor St., NE., Washington, D.C. 20018

Filed Aug. 24, 1979, Ser. No. 69,477
Int. Cl.³ H01J *31/02, 35/00*
U.S. Cl. 250—330 **23 Claims**

1. A radiant energy sensing element comprising a semiconductor capacitor having a semiconductor body member and at least one pair of electrodes and a second capacitor including a dielectric having a polarizable remanent dipole structure coupled to said semiconductor capacitor in such a way that an inversion layer is formed in said semiconductor body member, which when irradiated separates the electron /e/-hole/h/ pairs and collects the mobile carriers in the inversion layer.

20. An imaging system comprising
a pair of transversely oriented electrode arrays, at least one of said electrode array being transparent to radiant energy of a selected wave length (IR)
a dielectric means sandwiched between said electrode array, said dielectric means constituted of a dielectric having thermodielectric properties,
means for biasing said dielectric material to its Curie temperature,
means for applying a charging potential to said electrode arrays and said dielectric material,





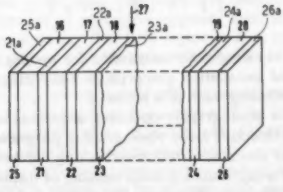
means for projecting an energy image upon said dielectric material,
and readout means coupled to said electrode arrays for developing an electrical signal for each cross point of said array which is proportional to said energy imgage imaged upon said dielectric material at each cross point, respectively.

4,250,385

SEMICONDUCTOR X-RAY DETECTOR

Gunter Luderer, Eltersdorf; Burghard Weinkauf, and Reiner Liebetruth, both of Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 777,917, Mar. 16, 1977, abandoned. This application Sep. 8, 1978, Ser. No. 940,562
Claims priority, application Fed. Rep. of Germany, May 20, 1976, 2622655
Int. Cl.³ G01T *1/20, 1/22*
U.S. Cl. 250—363 S **1 Claim**



1. In an x-ray measuring arrangement with an x-ray tube

having a focus and producing a fan-shaped x-ray beam extending from the focus for irradiating the entire cross section of a patient simultaneously, the x-ray tube being rotatable about the patient with the fan-shaped x-ray beam scanning a cross-section of the patient corresponding to the thickness of the fan-shaped x-ray beam, and a semiconductor x-ray detector curved about the focus of the x-ray tube and rotatable jointly with said x-ray tube about the patient, said detector comprising:

a plurality of fluorescent layers for converting the energy of the fan-shaped x-ray beam into light;

a plurality of separate light sensitive semiconductor diodes;

each member of said plurality of diodes is positioned between an associated pair of adjacent fluorescent layers forming an elongated row, each member of said plurality of fluorescent layers has an active edge directed toward the focus of the x-ray tube with each of said active edges of said fluorescent layers being equidistant from the focus and in the path of successive portions of said fan-shaped x-ray beam, each of said fluorescent layers has a pair of broad, spaced apart light-emitting faces directed longitudinally of said elongated row of semiconductor diodes and fluorescent layers and toward each of said adjacent semiconductor diodes, each of said semiconductor diodes has a pair of spaced apart, broad, light sensing surfaces directed longitudinally of said row and adjacent to respective fluorescent layers such that each said semiconductor diode receives activating light energy from said broad surfaces of a pair of adjacent fluorescent layers and generates an electrical output proportional to the sensed light energy.

4,250,386
X-RAY DIAGNOSTIC INSTALLATION FOR X-RAY PHOTOGRAPHS

Rolf Pfeifer, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

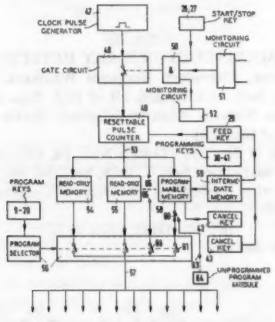
Filed Sep. 13, 1978, Ser. No. 942,124

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1977, 2747659

The portion of the term of this patent subsequent to Jan. 30, 1996, has been disclaimed.

Int. Cl.³ G03B *41/16*

U.S. Cl. 250—402 **2 Claims**



1. An x-ray diagnostic installation for making x-ray photographs, said installation comprising: x-ray diagnostic equipment for effecting each of a series of

respective photographic operating sequences in accordance with respective x-ray photographic programs,

said x-ray diagnostic equipment having components including an x-ray source, a table capable of displacement, and x-ray photographic means for taking x-ray photographs, said components being operable in different sequences in accordance with the respective x-ray photographic programs,

program control means having a series of read-only memory circuits for storing the respective x-ray photographic programs, and having an address input for control of addressing of said memory circuits,

a resettable pulse counter being connected with the address input for said read-only memory circuits for sequentially selecting the program steps of the respective memory circuits,

a clock pulse generator connected with the pulse counter for supplying control signals thereto to cause the pulse counter to sequentially select the program steps of the respective read-only memory circuits,

said read-only memory circuits having outputs for supplying program signals in accordance with the stored program steps that are selected by said pulse counter,

a program selection circuit connected with the outputs of said read-only memory circuits and selectively controlling the connection of the respective outputs with the components of said x-ray diagnostic equipment,

a freely programmable memory for storing a freely selected photographic program, having an address input controlled by said pulse counter for sequential selection of the program steps of the stored freely selected photographic program, and having a programmable memory output for selective connection with the components of said x-ray diagnostic equipment in place of said read-only memory circuits to control the same in accordance with the stored freely selected photographic program,

a program module (64) having storage means with a storage input, and operable for the reception and storage of a freely selected photographic program from the freely programmable memory (58),

change-over switch means (60) operable for selectively connecting said programmable memory output with said storage input for effecting the reception and storage of the program steps of the stored freely selected photographic program by said storage means of said program module (64), and switching means (66) in said program selection circuit (56) and selectively actuatable thereby for selectively cutting in said program module (64) after supply of a stored freely selected photographic program thereto from said freely programmable memory (58),

said switching means (66) having means (56) connected therewith and providing for the connection of said storage means of said program module (64) with said components of said x-ray diagnostic equipment under the control of said switching means (66).

4,250,387
MEDICAL RADIOGRAPHIC APPARATUS AND METHOD

Godfrey N. Hounsfield, Winthorpe; Richard M. Waltham, London, both of England; Daniel J. Pisano, Jr., Barrington, and Erlvada A. Olson, Wheeling, both of Ill., assignors to EMI Limited, England

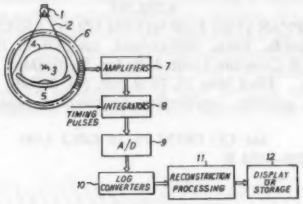
Filed Oct. 12, 1979, Ser. No. 84,123

Int. Cl.³ G03B *41/16*

U.S. Cl. 250—445 T **14 Claims**

11. Medical radiographic apparatus including: an x-ray tube in which an electron beam is incident on a target member to generate x-rays which propagate in a fan shaped distribution to pass through the body of a patient; a plurality of detectors arranged to receive the radiation after passage through the patient's body and to provide output signals indicative of the intensity of radiation received, for processing to provide a representation of the distribution of attenuation of the radiation in a cross-sectional slice of the patient's body; an attenuating member disposed between the x-ray tube and the patient's body to reduce differences of intensity of radiation received by the detectors after passing through the patient's body along paths of different length; and correcting means for reducing

components of the output signals resulting from received radiation which originated not from the region of the target at which the electron beam was incident but was generated at a halo therearound, for example by incidence of secondary electrons on the target.

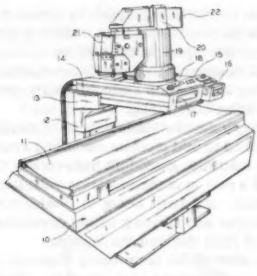


4,250,388

DEVICE FOR INTERFACING AN X-RAY IMAGE INTENSIFIER AND SPOT FILM DEVICE

Maria M. Janu, Brookfield, Wis., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 16, 1979, Ser. No. 66,981
Int. Cl.³ G03B *41/16*
U.S. Cl. 250—468 **5 Claims**



1. A coupling device for coupling an x-ray image intensifier and a spot filmer in x-ray apparatus, said apparatus including an x-ray tube operative to emit from its focal spot a diverging beam of x-rays about an axis passing through said focal spot, x-ray transmissive table means for supporting an examination subject in spaced relation to said tube, an x-ray spot filmer spaced further from said tube than said table means, said spot filmer when active intercepting and recording radiographic images of said subject which enter it and when inactive permitting said beam to exit, and an x-ray image intensifier coupled to said spot filmer for intercepting x-ray images exiting from said spot filmer, said coupling device comprising:

plate means mounted to said spot filmer and having an opening through which said beam exits and through which said axis passes,

a plurality of planar pads located on said plate means, said pads having a threaded hole,

a ring member having an opening through which said axis passes and having a radially inwardly extending flange element adjacent said opening for supporting an image intensifier on one side of said member with its axis to be aligned with said axis, said member having a plurality of planar areas on its other side arranged for interfacing with said pads when said member is superposed on said plate means,

said member having apertured circular recesses on its one side corresponding in location, respectively, with said planar areas on its other side, and

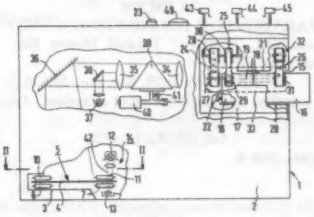
washer means having a circular periphery insertable in said recesses, respectively, said washer means having a hole coincident with the aperture in the recess, said hole and said aperture being for jointly receiving screws that thread into said threaded holes in said pad means respectively to effect locating the axis of said x-ray image intensifier coincident with said aforementioned axis.

4,250,389

DEVICE FOR IDENTIFYING X-RAY FILMS

Rudolf Brendl; Johann Finkenzeller, both of Erlangen, and Karl Weiss, Buckenhof, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 28, 1978, Ser. No. 946,604
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1977, 2747591
Int. Cl.³ H05G *1/28*
U.S. Cl. 250—476 **1 Claim**



1. A device for the indentification of x-ray films with the aid of a patient card insertable into the device, said device comprising:

(a) a housing (2) having a patient card receiving slot (15) for accommodating insertion of a patient card into said housing, and having means (17, 18) defining an elongated single unitary data field region to be occupied centrally by data on an inserted patient card,

(b) an optical image reproducing system in said housing including a light source (37) for supplying light to illuminate said data field region, and light directing means (38, 33) in said housing for directing light from said light source (37) to said single unitary data field region for illuminating said data field region for light projection of an image of a single unitary data field occupying said data field region,

(c) data carriers (24, 25, 26) at said data field region and each carrying a series of data symbols for selective alignment with said data field region directly alongside of the data on an inserted patient card to form a part of the single unitary data field with the data on an inserted patient card at said data field region,

(d) said data carriers each comprising a band having the series of data symbols spaced along the length thereof for selective movement into alignment with said data field region in accordance with the amount of longitudinal movement of the band, and respective ones of said bands being disposed at respective opposite ends of said elongated single unitary data field region so as to provide data symbols aligned with the right and left sides of the data of an inserted patient card,

(e) said housing having individually adjustable switch levers (43, 44, 45) accessible at the exterior of the housing, and having respective series of indicia (46, 47, 48) associated with the respective switch levers at the exterior of said housing for indicating the respective ones of said series of data symbols which can be aligned with said data field region,

(f) said individually adjustable switch levers **(43, 44, 45)** being coupled with the respective bands **(24, 25, 26)** such that positioning of the switch levers at the respective associated indicia of said series causes the corresponding data symbols on the respective bands to be positioned at the respective right and left sides of the data of an inserted patient card,

(g) said optical image reproducing system further comprising light image projecting means **(34, 35, 36)** associated with said data field region for directing a light image of the single unitary data field at said data field region including the data of an inserted patient card and the aligned data symbols to the right and left thereof, and

(h) x-ray film positioning means in said housing for positioning an x-ray film in operative association with said light image projecting means **(34, 35, 36)** so that the light image of the single unitary data field, including the data of an inserted patient card and the data symbols of said bands which are aligned with said single unitary data region, is projected onto an x-ray film positioned by said x-ray film positioning means, in a single work cycle.

4,250,390

APPARATUS FOR IRRADIATING A SURFACE

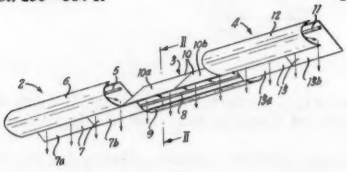
James Nicholson, "Kestlyn" Tinwall Downs Rd., Dumfries, Scotland (BG1 1TS)

Filed Mar. 30, 1979, Ser. No. 25,634

Claims priority, application United Kingdom, Apr. 11, 1978, 14132/78

Int. Cl.[3] **G01J** *1/00*

U.S. Cl. 250—504 R **10 Claims**



1. Apparatus for use in providing light radiation along an elongated surface in such a manner that the intensity of radiation may be substantially uniform along substantially the entire length of the surface, the apparatus comprising first mounting means for mounting a first elongated source of radiation; second mounting means for mounting a second elongated source of radiation in such a way that the longitudinal axes of the sources lie in a common plane which includes the longitudinal axis of the apparatus and that the first and second sources lie to opposite sides of the longitudinal axis of the apparatus and partially overlap in the axial direction; a first reflector directing radiation from the first source in a first band of substantially uniform intensity towards the longitudinal axis of the apparatus and generally parallel to the common plane; a first substantially planar mirror system extending at substantially 45° to the common plane for reflecting the first band of radiation through substantially 90° and towards the surface; a second reflector for directing radiation from the second source in a second band of substantially uniform intensity towards the longitudinal axis of the apparatus and generally parallel to the common plane; and a second substantially planar mirror system extending at substantially 90° to the first substantially planar mirror system for reflecting the second band of radiation through substantially 90° and towards the surface; the first and second substantially planar mirror systems having adjacent ends which are contiguous along the axis of the apparatus, that part of the first mounting means for mounting a first end of the first source being shielded from the first substantially planar mirror system by the rear surface of the second substantially planar mirror system, and that part of the second mounting means for mounting a first end of the second source being shielded from the second substantially planar mirror system by the rear surface of the first substantially planar mirror system.

4,250,391

APPARATUS FOR STERILIZING LIQUIDS

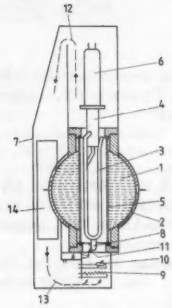
Pieter Bearda, Turgi, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed May 25, 1979, Ser. No. 42,526

Claims priority, application Switzerland, Jun. 7, 1978, 6207/78

Int. Cl.[3] **G01M** *21/24;* **G01J** *1/00*

U.S. Cl. 250—504 R **5 Claims**



1. An apparatus for sterilizing liquids by means of ultraviolet rays, wherein the source of radiation used is a low pressure, high current, mercury vapour lamp having a discharge tube on which is located an appendix-shaped piece of tube defining a mercury collecting chamber for collecting mercury condensed in the discharge tube, comprising:

a pipeline through which said liquids to be sterilized flow;

a housing attached to said pipeline, including a part transparent to ultraviolet rays extending transversely through the pipeline and a part in communication with the outer wall of the pipeline, said parts being in fluid communication with one another and defining a fluid circulating path, for circulation of fluid through the housing;

the discharge tube of the lamp being disposed in the part transparent to ultraviolet rays whereby ultraviolet rays from the discharge tube sterilize the liquid flowing through the pipeline;

heater means in the housing for heating fluid circulating through the housing; and

means for circulating a stream of air through the housing such that the air which has become warmed on the discharge tube travels through the housing and to the connecting part in communication with an outer wall of the pipeline, the air being cooled on the outer wall of the pipeline and being returned to the lamp at a temperature lower than the operating temperature of the appendix-shaped piece of tube, and the air first reaching the appendix-shaped piece of tube, wherein a predetermined temperature of the appendix-shaped piece of tube is regulated by air flowing over it and heated by said heater means, to thereby prolong the life of the lamp and also facilitate start up of the lamp.

4,250,392

BI-FOCAL COLLIMATOR

John W. Leask, Carlisle; John C. Leask, Dunstable, and Harry W. Straus, Newton Centre, all of Mass., assignors to Engineering Dynamics Corporation, Lowell, Mass.

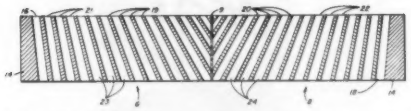
Filed Feb. 27, 1979, Ser. No. 15,598

Int. Cl.[3] **G02B** *5/00;* **G01T** *1/20*

U.S. Cl. 250—505 **8 Claims**

1. A collimator suitable for use in forming multiple, simulta-

neous images of a radioactive object upon a radiation sensitive member of a radiation receiving and imaging device, said collimator being formed of material opaque to radiation from said radioactive object, adapted for mounting between a radioactive object and the radiation sensitive member of a radiation receiving and imaging device, and comprising a top surface, a bottom surface, and at least two adjacent collimating sections separated by a bonding joint; each said collimating section being a grid-like arrangement of wall portions adapted to absorb substantially all radiation from said radioactive object



which impinges thereon extending between said top surface and said bottom surface defining a plurality of holes therebetween so disposed relative to each other that the radiation from said object passing through said holes from said bottom surface to said top surface converges upon a focal point located on a line passing through the center of the top surface of the section, which line forms an acute angle with the perpendicular axis of the top surface of the section, said acute angle being so chosen that radiation which has passed through the holes of one section will not interfere with radiation which has passed through the holes of any other section.

4,250,393

PHOTOELECTRIC APPARATUS FOR DETECTING ALTERED MARKINGS

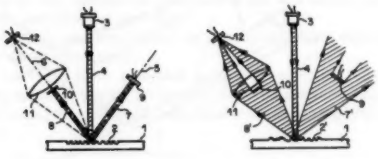
David L. Greenaway, Oberwil, Switzerland, assignor to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Filed Jan. 31, 1979, Ser. No. 8,427

Claims priority, application Switzerland, Mar. 20, 1978, 2995/78

Int. Cl.³ G06K *7/10*

U.S. Cl. 250—566 **8 Claims**



1. An optical reading system comprising:

a document including an information carrier having information recorded thereon in the form of first and second types of optical markings,

said first type optical marking comprising a first relief structure which deflects a reading light beam in at least one specific direction,

said second type optical markings comprising the first relief structure and a superimposed second relief structure which causes the reading light beam to be dispersed; and

apparatus for distinguishing between said first and second optical markings comprising:

a light source providing a light beam directed toward said document,

a first light sensor located on an optical axis to receive light within a cone including the light deflected from said first relief structure in said specific direction,

a second light sensor located on an optical axis to receive light outside the cone of light deflected from said first relief structure in said specific direction to thereby detect said dispersed light from said second relief structure, and

a comparator coupled to said first and second sensors for comparing the respective electrical signals therefrom and to indicate whether an optical marking being examined is of said first or second type.

4,250,394

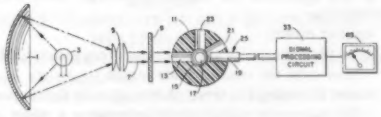
APPARATUS FOR DETERMINING IMMUNOCHEMICAL SUBSTANCES

John J. O'Connor, Rowland Heights, Calif., assignor to Akzona Incorporated, Asheville, N.C.

Division of Ser. No. 932,594, Aug. 9, 1978, which is a continuation-in-part of Ser. No. 909,862, May 26, 1978. This application Jul. 19, 1979, Ser. No. 59,098

Int. Cl.³ G01N *15/06*

U.S. Cl. 250—574 **7 Claims**



7. A photometer for detecting and measuring electromagnetic radiation transmitted at predetermined angles through a liquid sample, comprising:

(a) a suitable electromagnetic radiation source capable of providing radiation over a predetermined wavelength range;

(b) means for concentrating and collimating radiation from said electromagnetic radiation source to form a beam;

(c) means for (i) positioning a sample-containing cuvette in the path of the beam and for (ii) allowing the beam incident on the cuvette to be transmitted through the cuvette and sample, and for (iii) receiving a portion of the beam transmitted through the sample at two or more predetermined angles with respect to the beam, comprising:

a cuvette fixture comprising a tubular incident radiation beam aperture, a tubular cuvette opening, and at least two tubular radiation-receiving apertures, wherein the axes of all the apertures are coplanar and intersect along the axis of the cuvette opening and are perpendicular to the cuvette opening, and wherein the axes of the radiation-receiving apertures are fixed at predetermined angles with respect to the axes of (1) the incident radiation beam aperture and (2) the tubular cuvette opening, and attached thereto; and

a receptor-conveyor means comprising a tubular fiber-optic bundle terminated at one end by a substantially coaxial tubular detector cone, wherein the detector cone is (1) inserted in sealing engagement with one of said radiation-beam receiving apertures, and (2) has a substantially coaxial orifice at the end of the detector cone remote from the bundle, with dimensions such that electromagnetic radiation is transmitted at about a 6° admittance angle from the orifice to said fiber-optic bundle, and being at the intersection of the receiving aperture and the cuvette opening; and

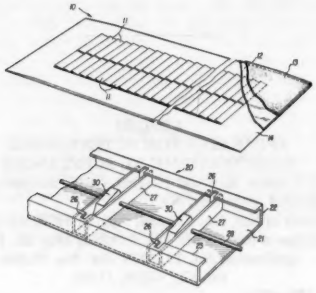
(e) means with the non-terminated end of the fiber-optic bundle and with the cuvette-positioning means for detecting and measuring substantially only a portion of the transmitted beam.

4,250,395

DEVICE FOR GENERATING ELECTRICITY BY PEDESTRIAN AND VEHICULAR TRAFFIC

Roy L. Lundgren, 1360 NE. 48th Ct., Ft. Lauderdale, Fla. 33334

Filed Jun. 21, 1979, Ser. No. 50,635
Int. Cl.[3] H02P *9/04*
U.S. Cl. 290—1 R **14 Claims**



1. An apparatus for recouping energy from traffic flow comprising:

support means;

tread plate means for transmitting forces generated by traffic flow over the treaded plate means;

means mounting the tread plate means on the support means for movement relative thereto between a raised and lowered position;

rocker arm means engaged by the tread plate means for rotation about a pivot of said rocker arm means from a raised to a lowered position as the tread plate means moves from the raised to the lowered position;

shaft means for transmitting torque;

means mounting said pivot of the rocker arm means directly to the shaft means to rotate the shaft upon rotation of the rocker arm means, said mounting means including one-way clutch means which engages the shaft means when the rocker arm is rotated from the raised to the lowered position and disengages when the rocker arm means returns to the raised position, and

means connected to the shaft means for storing or converting energy.

4,250,396

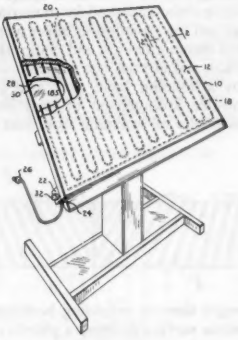
HEATED DRAFTING BOARD

Arnold T. Moeller, Chesterton, Ind., assignor to Walter Leuca, Merrillville, Ind.

Continuation of Ser. No. 911,770, Jun. 2, 1978, abandoned. This application Sep. 4, 1979, Ser. No. 72,144
Int. Cl.[3] H05B *1/00*
U.S. Cl. 219—218 **8 Claims**

1. A drafting board having a top drawing surface and an opposed bottom surface, wherein the improvement comprises:

an electric resistant heating wire circuit connected throughout its length to said drafting board for heating said top drawing surface; and



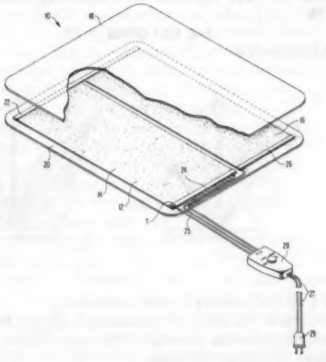
means connected to said circuit for connection to an electrical source.

4,250,397

HEATING ELEMENT AND METHODS OF MANUFACTURING THEREFOR

Geoffrey I. Gray, Chester, N.Y., and John O. Freeborn, New Fairfield, Conn., assignors to International Paper Company, New York, N.Y.

Filed Jun. 1, 1977, Ser. No. 802,576
Int. Cl.[3] H05B *3/00*
U.S. Cl. 219—345 **10 Claims**



1. A heating pad comprising a pair of sheet-like segments each formed of a paper sheet containing a predetermined percentage of graphite fibers and saturated with a thermoplastic material;

a pair of flexible plastic cover sheets disposed on opposite sides of and thermally and chemically bonded to said segments by said thermoplastic, said segments being integral with said cover sheets, and

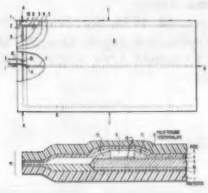
electrical circuit means for applying current to said graphite fiber-containing segments and resistively heating said pad, including means for electrically coupling said segments in series one with the other and means for controlling current in said segments in response to variations in temperature in the heating pad for maintaining the resistive heat output at a predetermined temperature.

4,250,398

SOLID STATE ELECTRICALLY CONDUCTIVE LAMINATE

Harold Ellis, Miami Beach; Alexander De Fonso, Hollywood, both of Fla., and Stephen Rosa, Bethesda, Md., assignors to Delphic Research Laboratories, Inc., Miami, Fla.

Filed Mar. 3, 1978, Ser. No. 883,008
Int. Cl.[3] H05B 3/06
U.S. Cl. 219—345 17 Claims



1. A unitary, composite, laminated article of manufacture comprising:

(A) an electrically insulating top layer having an inner surface and an outer surface;

(B) a first barrier layer of polymeric material having a water vapor transmission rate (ASTME 96) not exceeding about 0.5 g/100 sq.in./24 hr/mil at 37.8° C., wherein said first barrier layer substantially covers said inner surface of said top layer;

(C) an electrically insulating bottom layer having an inner surface and outer surface;

(D) a second barrier layer of polymeric material having a water vapor transmission rate (ASTME 96) not exceeding about 0.5 g/100 sq.in./24 hr/mil at 37.8° C., wherein said second barrier layer substantially covers said inner surface of said bottom layer;

(E) a substantially continuous, electrically conductive layer of substantially uniform thickness between said first and second barrier layers, wherein said electrically conductive layer is comprised mainly of carbon and is capable of emitting electromagnetic radiation when an electric current is passed therethrough;

(F) electrical conductor means in contact with said electrically conductive layer;

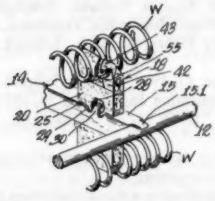
wherein said top layer and said bottom layer have edges, which are sealed together to thereby form an enclosed laminate containing an electrically conductive layer having stable resistivity.

4,250,399

ELECTRIC HEATING ELEMENTS

Reynold C. King, Wytheville, Va., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Jan. 22, 1979, Ser. No. 1,558
Int. Cl.[3] H05B 3/06
U.S. Cl. 219—532 5 Claims



1. An open coil heater assembly, comprising,

a metal support member,

a helically-coiled resistance wire connected to and supported by said support member at a plurality of places,

an insulator member at each of said places for electrically insulating said resistance wire from said support member, each insulator member being of one-piece molded refractory material and having a portion generally rectangular in transverse cross section to provide generally flat parallel opposed side surfaces,

said insulator portion having a slot extending inwardly from an end thereof and transversely from one to the other of said opposed surfaces, said slot being sized and arranged to freely pass and receive a portion of the resistance wire between adjoining convolutions to permit said coiled resistance wire to extend transversely of and from said opposed surfaces and whereby said wire portion may be moved to position within said slot without hindrance from the defining walls of said slot,

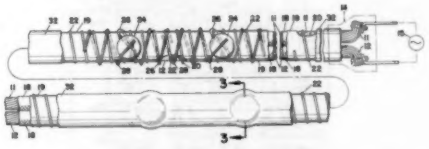
at least one of the opposed flat surfaces having a portion inclining transversely from a longitudinal edge thereof and inwardly toward said slot in a direction toward the opposed surface, and such surface having a hook-like projection extending therefrom to overlie the wire portion within said slot and thereby restrict its withdrawal from said slot.

4,250,400

FLEXIBLE TEMPERATURE SELF REGULATING HEATING CABLE

Maw H. Lee, Cleveland, Ohio, assignor to The Scott & Fetzer Company, Cleveland, Ohio

Filed Nov. 19, 1979, Ser. No. 95,249
Int. Cl.[3] H05B 3/56
U.S. Cl. 219—549 3 Claims



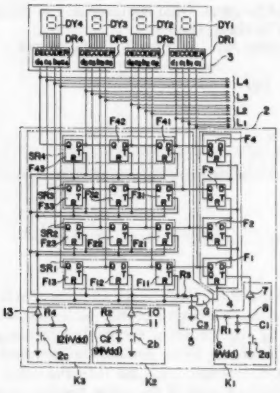
1. In a flexible heating cable, a pair of power leads extending side by side along the length of the cable, insulation means extending along the length of the cable and separating and surrounding the power leads, notches through said insulation means of first one power lead and then the other at spaced locations along the length of the cable, heating wire helically wrapped around the pair of power leads and the insulation means and extending along the length of the cable and contacting first one power lead and then the other through said notches, said helically wrapped heating wire forming a series of resistive heating segments each connected across the power leads in positionally serial end-to-end relationship but in electrically parallel relationship with the other segments, each of said electrically parallel segments having its own temperature-responsive variable resistance chip for controlling the level of resistive heating in the segment, each said temperature-responsive variable resistance chip being supported against said pair of insulated power leads, the inner face of each said chip overlying and being electrically connected with said helically wrapped heating wire to furnish an inner-face connection, each said chip having an outer chip lead extending from the outer face of the chip downwardly into contact with said helically wrapped heating wire at an initial contact point spaced on the cable from said inner-face connection to establish an outer-face connection, each said chip having associated therewith a break in the helically wrapped heating wire between said inner-face connection and said outer-face connection to thereby divert all heating wire current through said chip and establish an electrically serial relationship between the chip and the one of the said electrically parallelly related resistive heating segments

with which the chip is associated, and an insulating casing formed over all the foregoing elements, whereby the cable may be economically fabricated by notching, wrapping, cutting and extruding operations and yet each segment is self-regulating independently of the other segments, the longitudinal extent of said temperature-responsive element of each electrically parallel segment being only a small fraction of the length of the segment whereby the longitudinal extents of all the temperature-responsive elements totaled together amount to only a small fraction of the length of the cable, the longitudinal extent of each of said electrically parallel segments being only a small fraction of the longitudinal extent of the cable whereby the temperature of the cable may be maintained essentially uniform along the length of the cable despite variation in ambient conditions along its length and despite the very limited total longitudinal extent of the temperature-responsive elements taken together.

4,250,401
DATA INPUT DEVICE

Shizuo Sumida, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Dec. 1, 1978, Ser. No. 965,692
Claims priority, application Japan, Dec. 1, 1977, 52/161945[U]
Int. Cl.[3] H03K *21/30*
U.S. Cl. 235—92 DE **7 Claims**



1. A data input device to be coupled with a data processing device for use in a vehicle, said data input device comprising:

counter means;

a data key for entering numerical values into said counter means one for each tap applied to said data key;

said counter means being coupled to said data key for receiving and counting the number of the taps applied to said data key and for generating an output signal indicative of the number of the taps counted thereby;

a shift key;

shift register means including a plurality of memory units connected in series with each other and having first and second inputs connected respectively to said counter means and said shift key, so that, upon manipulation of said shift key, the numerical values carried in said counter means and in each of said memory units are simultaneously shifted to respective next adjacent said memory units in said series of memory units;

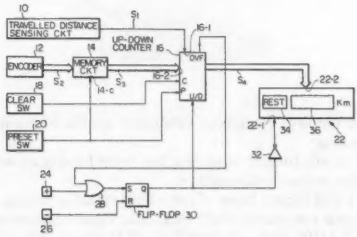
delay means connected between said shift key and said counter means for applying a reset signal to said counter means a predetermined time interval after said shift key has been manipulated, to reset said counter means; and

means for applying the numerical values obtained from said shift register means and from said counter means to a data processing device.

4,250,402
ELECTRONIC TRIP METER FOR A MOTOR VEHICLE

Masanori Mizote, Yokosuka; Kiyoshi Yamaki, Yokohama; Takashi Oka, Tokyo; Hideoki Matsuoka, Yokohama; Hiroyuki Nomura, Yokohama, and Takaaki Mogi, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 13, 1978, Ser. No. 968,982
Claims priority, application Japan, Dec. 23, 1977, 52-156053
Int. Cl.[3] G06M *3/14*; G06F *15/20*
U.S. Cl. 235—92 DN **16 Claims**



1. An electronic trip meter for a motor vehicle, comprising:

(a) first means for producing a pulse signal each time said vehicle travels over a predetermined unit distance;

(b) second means for counting up or down the number of pulses applied from said first means, said second means producing an output signal indicative of a distance travelled by said vehicle when counting up said number of pulses from zero, said second means producing an output signal indicative of a remaining distance to an objective point when counting down said number of pulses from a preset value corresponding to a preset distance;

(c) third means for presetting said distance in said second means;

(d) fourth means responsive to manual switch means for producing an up-down control signal, said up-down control signal being fed to said second means for controlling the counting up and counting down functions thereof;

(e) fifth means for displaying a distance represented by the output signal of said second means; and

(f) sixth means for producing a signal indicating that the remaining distance equals zero, said signal being fed to said fourth means for producing said up-down control signal.

4,250,403
ELECTRONIC TRIP METER WITH A CORRECTION CIRCUIT FOR AN AUTOMOTIVE VEHICLE

Hiroyuki Nomura; Takaaki Mogi, both of Yokohama; Masanori Mizote, Yokosuka; Kiyoshi Yamaki, Yokohama; Takashi Oka, Tokyo, and Hideoki Matsuoka, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 13, 1978, Ser. No. 968,981
Claims priority, application Japan, Dec. 23, 1977, 52-156054
Int. Cl.[3] G06F *15/20*; G06M *3/14*
U.S. Cl. 235—92 DN **12 Claims**

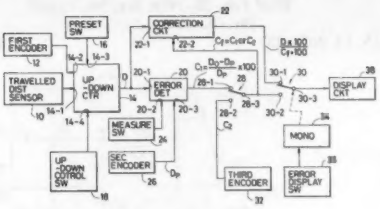
1. An electronic trip meter with a correction circuit for an automotive vehicle, comprising:

(a) first means for producing a signal indicative of a function of a distance travelled by the vehicle;

(b) second means coupled to said first means for producing a signal indicative of an error factor of said function,

said second means including means for storing first and

second distances both represented by said signal produced by said first means, said first distance indicating a starting point of a predetermined distance and said second distance indicating an end point of said predetermined distance, means for producing a difference between said first and second distances to obtain a measured distance measured along said predetermined distance, and means for detect-



ing said error factor from said measured distance and said predetermined distance;

(c) third means coupled to said first and second means for correcting said function by said error factor; and

(d) fourth means coupled to said third means for displaying an information in response to an output from said third means.

4,250,404

ELECTROMAGNETIC COUNTERS

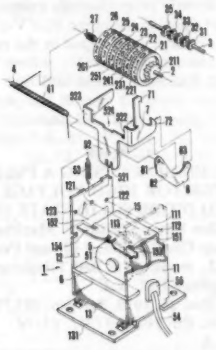
Yukio Yamamoto, and Takeo Tezuka, both of Yonezawa, Japan, assignors to Tamura Electric Works, Ltd., Tokyo, Japan

Filed Feb. 8, 1979, Ser. No. 10,225

Claims priority, application Japan, Apr. 12, 1978, 53/46989[U]

Int. Cl.³ G06M *3/12*

U.S. Cl. 235—92 FP **2 Claims**



1. An electromagnetic counter comprising:

a frame including a pair of spaced parallel side plates;

a plurality of digit wheels rotatably mounted on a shaft extending between said side plates, a first order digit wheel of said a plurality of digit wheels including a star wheel on one side thereof;

a plurality of pinions rotatably mounted on a pinion shaft extending between said side plates in parallel with said first mentioned shaft for effecting carries of said digit wheels;

a driving member including a pair of feed pawls alternately engaging said star wheel for driving the same;

electromagnetic driving means mounted on said frame for causing said driving member to drive said star wheel; and

a control member pivotally mounted on one side plate near said driving member for preventing the driving member from swinging or advancing when an external shock or vibration is applied to said counter thereby to avoid causing said star wheel to misoperate, said control member comprising a C shaped member disposed between one side plate and said driving member, and urged by spring means in a direction opposite to the direction of rotation of said star wheel, said control member pivotally supported at its upper end and provided with a first cam means at about the center of the side surface thereof facing said driving member and a second cam means at the lower end, said first cam means being positioned on one side of one feed pawl and said second cam means engages the tip of the other feed pawl of said driving member, and wherein one of said feed pawls normally engages said star wheel but is moved to one side thereof when said driving member is tilted by said electromagnetic driving means and the other feed pawl is normally held out of engagement from star wheel but engages said star wheel when said driving member is tilted by said electromagnetic driving means.

4,250,405

APPARATUS FOR IDENTIFYING PRODUCTION CODES ON ARTICLES

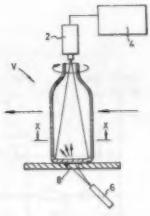
Richard I. Ashcroft, Harpenden; David Kaktovics, Gainsborough; Anthony E. P. Monson, Bushey, and David M. Weeks, Luton, all of England, assignors to United Glass Limited, Staines, England

Filed Oct. 29, 1979, Ser. No. 89,561

Claims priority, application United Kingdom, Oct. 30, 1978, 42379/78

Int. Cl.³ G06K *7/14, 19/06*

U.S. Cl. 235—456 **9 Claims**



1. An apparatus for identifying a production code appearing on an article, which comprises light beam detection means responsive to light from a source of illumination and which has been reflected or refracted from a production code on an article, scanning means to enable the light beam detection means to scan the article whereby an output signal characteristic of the code is provided, means for creating at least one window in time within each scan period, detection means responsive to the window creation means and to the light beam detection means to provide a signal characteristic of any code marks detected during only the window in time, and means responsive to the detection means for decoding the signals therefrom to provide an indication of the code on the article.

4,250,406

SINGLE CLOCK CMOS LOGIC CIRCUIT WITH SELECTED THRESHOLD VOLTAGES

Allan A. Alaspa, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

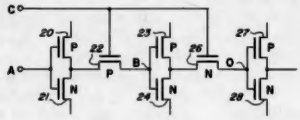
Filed Dec. 21, 1978, Ser. No. 971,755

Int. Cl.³ H03K *19/08*; G11C *19/28*

U.S. Cl. 307—205 **14 Claims**

12. A CMOS circuit useful in sequential logic circuits and having a circuit input for an input signal and a clock input for a clock signal, comprising: first means for inverting the input signal, the first means having an input coupled to the circuit

input and having an output; second means for inverting and having an input and an output; a first controllable coupler for coupling the output of the first means to the input of the second means, the first controllable coupler being controllable by the clock signal; third means for inverting having an input and an output; and a second controllable coupler for coupling the



output of the second means to the input of the third means, the first and second controllable couplers having a threshold voltage within a first predetermined range, and the second and third means each having at least one field effect transistor having a threshold voltage within a second predetermined range.

4,250,407

MULTI FUNCTION PATCH PIN CIRCUIT

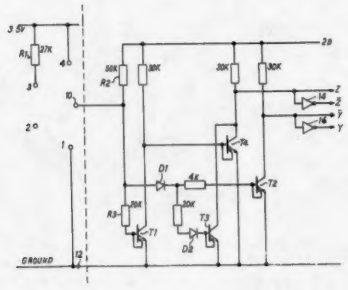
Howard A. Dorey, Godalming; Edward A. Martin, Church Crookham, and Michael I. Spooner, Aldershot, all of England, assignors to The Solartron Electronic Group Limited, Farnborough, England

Filed Nov. 23, 1977, Ser. No. 854,282

Claims priority, application United Kingdom, Nov. 26, 1976, 49505/76

Int. Cl.[3] **H03K** *10/082, 17/62, 5/153*

U.S. Cl. 307—209 **8 Claims**



1. An integrated circuit having external pins including at least one patch pin arranged to receive a patching signal to patch data into said circuit and two further pins arranged to be coupled to respective voltage supply rails; and internal circuit means comprising an input, means coupling said input to said patch pin, first and second outputs, means for establishing a first predetermined operative level at said input in the absence of connection to said patch pin, and a plurality of interconnected semiconductor devices having respective predetermined first, second and third operative thresholds which are intermediate two respective operative levels each established at said input by coupling of said patch pin to a respective one of said supply rails, said first threshold being the closest of said thresholds to one of said two operative levels, said second threshold being the closest of said thresholds to the other of said two operative levels, and said third threshold being between said first and second thresholds and also being the only one of said thresholds between said first predetermined operative level and a second predetermined operative level established at said input by connection of said patch pin via resistance means to a predetermined one of said supply rails, said semiconductor devices coupling said input to said outputs such that, for each of said operative levels established at said input as aforesaid, said circuit means supplies a respective and different combination of binary digit levels at said outputs.

4,250,408

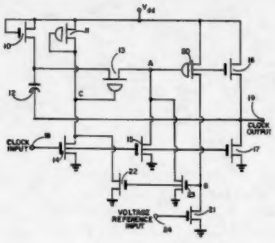
CLOCK PULSE AMPLIFIER AND CLIPPER

John R. Spence, Villa Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 28, 1979, Ser. No. 16,249

Int. Cl.[3] **H03K** *5/08, 5/13*

U.S. Cl. 307—237 **11 Claims**



1. A voltage regulator circuit comprising:

clock input means for supplying a clock input signal having a predetermined first voltage range;

sensing means connected to said clock input means for detecting the voltage level of said clock input signal;

regulating means having an input connected to said sensing means and an output, said regulating means functioning to reduce said predetermined first voltage range of said clock signal to a smaller second voltage range; and

clock output means connected to said output of said regulating means for producing a clock output signal having said second voltage range, said regulating means functions to substantially linearly proportionally reduce the amplitude V of said input signal in the range $V_o < V < V_1$, and to clip the amplitude of said input signal in the range $V > V_1$ to substantially constant values αV_1, where V_o and V_1 are predetermined constants within said first voltage range, and $0 < \alpha < 1$.

4,250,409

CONTROL CIRCUITRY USING A PULL-DOWN TRANSISTOR FOR HIGH VOLTAGE FIELD TERMINATED DIODE SOLID-STATE SWITCHES

James A. Davis, Glen Ellyn; William F. MacPherson, Winfield Township, DuPage County, both of Ill., and Peter W. Shackle, Bridgewater, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

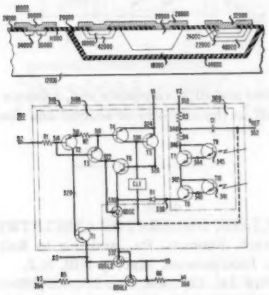
Filed Dec. 28, 1979, Ser. No. 107,778

Int. Cl.[3] **H03K** *17/51, 17/74*

U.S. Cl. 307—252 A **11 Claims**

1. Circuitry for use with a first switching device (GDSL1) of the type comprising a semiconductor body (16) a bulk portion of which is of a relatively high resistivity, a first region (18) of a first conductivity type and of a relatively low resistivity, a second region (24) of a second conductivity type opposite that of the first conductivity type, the first (18) and second (24) regions being connected to output terminals of the switching device, a gate region (20) of the second conductivity type, the gate region (20) being coupled to a control terminal of the switching device (GDSL1), the first (18), second (24) and gate (20) regions being mutually separated by portions of the semiconductor body bulk portion (16), the parameters of the device being such that, with a first voltage applied to the control terminal of the first switching device (GDSL1), a potential is established within a cross-sectional portion of the bulk of the semiconductor body (16) which is substantially different from that of the potential of the first (18) and second (24) regions and

which prevents current flow between the first (**18**) and second (**24**) regions, and that, with a second voltage applied to the control terminal of the first switching device (GDSL1) and with appropriate voltages applied to the output terminals (XO, YO) of the first switching device, a relatively low resistance current path is established between the first (**18**) and second (**24**) regions by dual carrier injection, a second switching device (GDSC) of the same type as said first switching device, an output terminal **332** of the second switching device (GDSC) being coupled to the control terminal of the first switching device (GDSL1), a first branch circuit (**310A**) coupled to the



second switching device (GDSC) for controlling conduction between the first and second regions thereof, characterized by circuit means (**T1**) being coupled to the control terminal (**332**) and to one of the output terminals (XO) of the first switching device (GDSL1) and having a control terminal (**320**) coupled to an input terminal (**312**) of the circuitry, the circuit means (**T1**) being adapted to selectively cause the control terminal (**332**) of the first switching device (GDSL1) to be close in potential to that of the output terminal (XO) of the first switching device (GDSL1) which is coupled thereto.

4,250,410

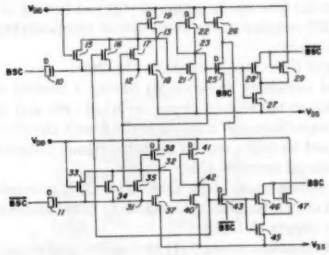
SPEED-UP CIRCUIT

Jerry D. Moench, and Rodney C. Tesch, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 27, 1979, Ser. No. 15,836

Int. Cl.[3] **H03K** *5/12, 3/26*

U.S. Cl. 307—263 **12 Claims**



1. A speed-up circuit for speeding up a voltage transition on a first and a second conductor for carrying complementary signals, comprising: a first inverter having an input and an output, the input being coupled to the first conductor; a second inverter having an input and an output, the input of the second inverter being coupled to the output of the fist inverter; first, second and third field effect transistors coupled in parallel between the input and output of the first inverter, each of the field effect transistors having a gate electrode, the gate electrode of the first transistor adapted for coupling to a first voltage potential, the gate electrode of the second transistor being coupled to the output of the second inverter; first feedback means coupling the output of the second inverter to the first conductor thereby reinforcing a signal appearing on the first conductor; a third inverter having an input coupled to the second conductor and having an output; a fourth inverter having an input coupled to the output of the third inverter and having an output coupled to the gate electrode of the third transistor; fourth, fifth and sixth field effect transistors coupled in parallel between the input and output of the third inverter and each transistor having a gate electrode, the gate electrode of the fourth transistor adapted for coupling to the first voltage potential, the gate electrode of the fifth transistor being coupled to the output of the second inverter, and the gate electrode of the sixth transistor being coupled to the output of the fourth inverter; second feedback means coupling the output of the fourth inverter to the second conductor thereby reinforcing any signal appearing on the second conductor which is changing in a predetermined direction.

4,250,411

DYNAMIC RESISTOR CURRENT LEAKAGE COMPENSATION ARRANGEMENT

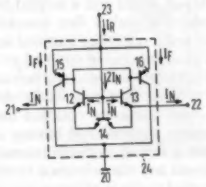
Hans Kriedt, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

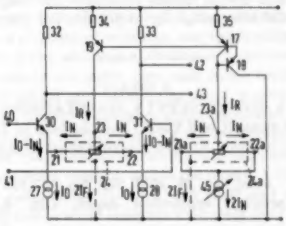
Filed Jan. 26, 1979, Ser. No. 6,869

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1978, 2804142

Int. Cl.[3] **H03L** *5/00;* **H03G** *3/00*

U.S. Cl. 307—264 **2 Claims**





1. A circuit arrangement for compensating leakage currents of a dynamic resistor which is employed as a gain control element of an integrated wide band amplifier, said circuit arrangement comprising:

a first dynamic resistor for connection to the amplifier as the gain control element, including two transistors having commonly connected bases constituting a first control input, commonly connected collectors, and respective emitters which serve as the resistor terminals of said first dynamic resistor;

a second dynamic resistor, including two transistors having commonly connected bases constituting a second control input, commonly connected collectors, and respective

emitters which serve as the resistor terminals of said second dynamic resistor;

current charging means connected to said emitters of said second dynamic resistor for feeding a control current into the base-emitter paths of the two transistors thereof; and

current control means connected to said first and second control inputs and operating to cause the currents flowing at said first and second control inputs to be equal.

4,250,412

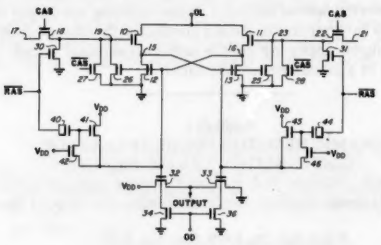
DYNAMIC OUTPUT BUFFER

Roger I. Kung, and Jerry D. Moench, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 5, 1979, Ser. No. 17,748

Int. Cl.³ H03K *3/26, 5/22*

U.S. Cl. 307—279 **6 Claims**



1. A dynamic output buffer to buffer output data from a memory, comprising: a cross coupled sense amplifier having a first and a second input, a first and a second output and being controlled by a control signal; a first transistor coupled between the first input and a reference terminal and having a gate electrode, the gate electrode being coupled to the first output; a second transistor coupled between the second input and the reference terminal and having a gate electrode coupled to the second output; a third transistor coupled between the first input and the reference terminal and having a gate electrode coupled to an enabling signal; a fourth transistor coupled between the second input and the reference terminal and having a gate electrode coupled to the enabling signal so that when the third and fourth transistors are enabled the output data from the memory is prevented from entering the cross coupled sense amplifier; and output means to couple the output from the cross coupled sense amplifier to provide the output data from the memory.

4,250,413

CAMERA POWER SUPPLY MAINTAINING CIRCUIT

Masahiro Kawasaki, and Yoshio Sawada, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

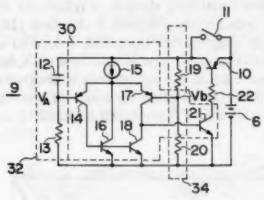
Filed Sep. 29, 1978, Ser. No. 947,314

Claims priority, application Japan, Oct. 4, 1977, 52-133417[U]

Int. Cl.³ H03K *5/13, 5/159*

U.S. Cl. 307—293 **7 Claims**

1. In a power supply maintenance circuit for a camera having a source of electric power, a load and power switch provided between the electric source and the load, the improvement comprising; a timer circuit connected in parallel to said load and a switching transistor connected in parallel to the power switch, the switching of said transistor being controlled by said timer circuit; wherein said timer circuit comprises comparator means coupled to said transistor, a charging circuit coupled to said power source and said comparator means and a reference voltage generating circuit coupled to said comparator means; wherein said comparator means comprises a first transistor coupled to said switching transistor, second and third transistors having a common collector junction coupled to the base of said first transistor, a fourth transistor having its emitter coupled to the emitter of said second transistor, a fifth transistor, the collector of said fourth transistor coupled to the



bases of said third and fifth transistors and, a source of constant current coupled to the emitters of second and fourth transistors.

4,250,414

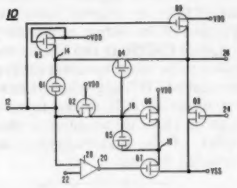
VOLTAGE GENERATOR CIRCUITRY

Howard C. Kirsch, Emmaus, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 31, 1978, Ser. No. 929,369

Int. Cl.³ H03K *3/00, 5/02, 17/10;* **H02M** *9/04*

U.S. Cl. 307—296 A **7 Claims**



1. Voltage generator circuitry (**10**) includes first, second and third circuit terminals (**12, 16, 18**); a first switching device (Q2) having a first output terminal coupled to the first circuit terminal (**12**) and having a second output terminal coupled to the second circuit terminal (**16**); a first capacitor means (Q5) having a first terminal coupled to the second circuit terminal (**16**) and having a second terminal coupled to the third circuit terminal (**18**); a delay gate (**28**) having a first input terminal coupled to the first circuit terminal (**12**) and having an output terminal (**20**) coupled to the third circuit terminal (**18**); and is characterized by:

fourth and fifth circuit terminals (**14, 26**);

a second switching device (Q4) having a control terminal coupled to the second circuit terminal (**16**), and having a first output terminal coupled to the fourth circuit terminal (**14**), and having a second output terminal coupled to the fifth circuit terminal (**26**);

voltage setting means (Q3, Q15, Q16, Q17) coupled to the fourth circuit terminal (**14**) and being connectable to a first power supply (VDD);

a second capacitor means (Q1) having first and second terminals coupled to the first and fourth circuit terminals (**12, 14**), respectively;

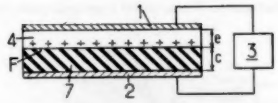
the first (**12**) and fifth (**26**) circuit terminals being connectable to an input terminal and an output terminal, respectively; and

a third switching device (Q9) having a control terminal coupled to the first terminal (**12**), a first output terminal coupled to the fifth circuit terminal (**26**), and a second output terminal connectable to the first power supply (VDD).

4,250,415
ELECTROMECHANICAL TRANSDUCERS USING AN ELECTRET

Jacques Lewiner, 5, rue Bory d'Arnex, 92210 Saint-Cloud, and Claude Hennion, 50, rue de la Clef, 75005 Paris, both of France

Filed Jun. 29, 1978, Ser. No. 920,158
Claims priority, application France, Jul. 4, 1977, 77 20524
Int. Cl.³ H01G 7/02; H04R 19/00
U.S. Cl. 307—400 **16 Claims**

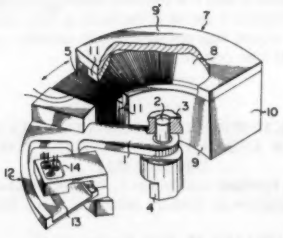


1. An electro-mechanical transducer comprising disposed between two electrically conducting electrodes which have connected to the same outside utilization circuit, on the one hand, an electret comprising a dielectric foil permanently electrically charged on at least one of its two faces or adjacent thereto, and on the other hand, disposed between said at least one face of the electret and the facing electrode face, a solid intermediate layer made from a material having a deformability different from that of the electret, the material forming said intermediate layer having an electrical resistivity at least greater than 10^{15} ohms/cm and said intermediate layer having a smooth and continuous face in intimate contact with the whole of the useful area of said at least one charged face of the electret.

4,250,416
MOVING-COIL TYPE MOTOR

Junichi Watanabe, Kawaski; Hiroshi Koide, Sagamihara, and Shigemoto Temmyo, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 26, 1978, Ser. No. 954,763
Claims priority, application Japan, Nov. 24, 1977, 52-140980
Int. Cl.³ H02K 41/07
U.S. Cl. 310—13 **8 Claims**



1. In a moving-coil type motor for limited angular movement of an object, said motor including:

a hollow moving coil to which electrical energy is to be applied;

a magnetic circuit member made of a material having high permeability, said magnetic circuit member including an inner portion disposed within the hollow part of said moving coil and an outer portion disposed outside said moving coil, said inner and outer portions having interconnected rear ends; and

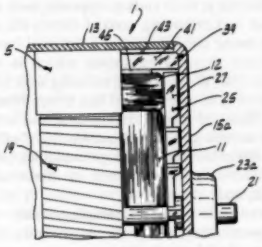
a magnet installed on said magnetic circuit member;

the improvement comprising an arm member, one end of said moving coil being fixed to the fore end of said arm member, and a shaft rotatable for limited angular movement of the object about the axis of said shaft, the base of said arm member being mounted on said rotatable shaft, said moving coil being curved into a circular arc centering around said shaft and having a rectangular-shaped cross section, said magnetic circuit member also being curved into a circular arc centering around said shaft similar to the moving coil, the cross section of each of said inner and outer portions being of rectangular shape similar to that of said moving coil, the length of the moving coil along its circular arc direction being greater than the length of the magnet along the circular arc direction of the magnetic circuit member.

4,250,417
AIR DEFLECTOR FOR ELECTRIC MOTOR

Harold D. Arnold, St. Louis, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Dec. 21, 1978, Ser. No. 971,864
Int. Cl.³ H02K 9/06
U.S. Cl. 310—62 **6 Claims**



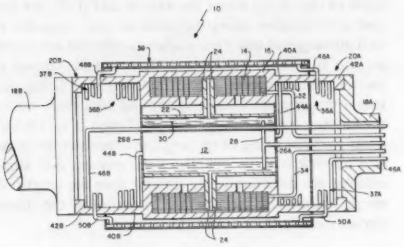
1. In an electric motor having a stator assembly including a stack of lamination plates constituting a stator core, the latter having a central bore therethrough and a plurality of radial slots therein, a plurality of windings inserted in said slots with the end turns of the windings extending in axial direction out beyond the ends of said stator core, said motor further having a shell within which said stator is mounted, a rotor rotatable within the bore of said stator core, a shaft affixed to said rotor, an end shield on at least one end of the shell, bearing means carried by the end shield for receiving said shaft and for journalling said rotor for rotation within the motor, a fan having a plurality of vanes rotatable with said shaft and rotor, said motor having one or more fasteners extending from said stator core in axial direction with respect to the motor toward said end shield, said fasteners being disposed radially outwardly from said stator windings and from the tips of said fan vanes, wherein the improvement comprises: at least one air deflector mounted within said motor adjacent the end turns of said stator windings between said stator windings and said shell and between said stator core and said end shield, and adjacent the tips of the fan vanes, said air deflector comprising an elongate unitary member having a longitudinal opening therethrough, said opening receiving a respective said fastener thereby to secure said deflector in position on said motor, said deflector substantially blocking the circular flow of air within said motor between said shell and said stator winding end turns and aiding said fan in circulating air in axial direction through the motor.

4,250,418

SUPERCONDUCTING GENERATOR AND METHOD

Phillip W. Eckels, Pittsburgh, Pa., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed May 11, 1978, Ser. No. 905,041
Int. Cl.³ H02K *1/32*
U.S. Cl. 310—64 **2 Claims**



1. A superconducting generator comprising:

(a) a rotor assembly adapted to be super cooled, said assembly including

(i) superconducting field windings,

(ii) cylindrical means for supporting said windings, and

(iii) housing means within said cylindrical means adapted for containing liquid helium therein:

(b) first and second cylindrical torque tubes respectively connected at their ends to opposite ends of said cylindrical means and extending coaxial therewith, said torque tubes each being constructed of a material having a coefficient of linear thermal expansion which is negligible at and below 100° K., said material being selected from the group consisting of steel, nickel and chromium;

(c) a cylindrical thermal radiation shield mounted concentrically around and spaced outwardly of said rotor assembly, said shield including passage means adapted to pass helium gas internally through and in direct contact with said shield; and

(d) a cryogenic cooling arrangement for

(i) supercooling said rotor assembly during normal operation of said generator,

(ii) maintining predetermined axial sections of said torque tubes at temperatures at or below 100° K. during said normal operation, whereby to minimize thermal expansion of said sections and damage therefrom in the event said generator operates in an abnormal way so as to cause said sections to drop significantly in temperature,

(iii) maintaining said shield at a temperature at or above 100° K. during said normal operation, and

(iv) maintaining the remaining sections of said torque tubes at a temperature approximately at or above the temperature of said shield at any given time during said normal operation and also during said abnormal operation;

(e) said cryogenic cooling arrangement including

(i) a source of liquid helium within said rotor assembly housing means, some of said liquid helium being reduced to gas during said normal operation for providing a source of helium gas therein,

(ii) means for directing continuous streams of said helium gas adjacent to and along said predetermined torque tube sections at a predetermined flow rate to maintain said predetermined sections at or below 100° K.,

(iii) means for directing said streams of helium gas from said predetermined sections through said passage means in said shield for maintaining said shield at or above 100° K. during said normal operation, and for directing said streams through said passage means during said abnormal operation, and

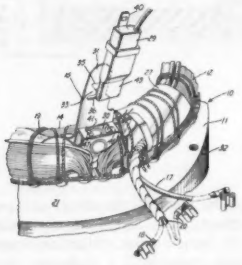
(iv) means for directing said streams from said shield adjacent to and along said remaining torque tube sections during said normal operation and during said abnormal operation for maintaining said remaining sections at a temperature approximately at or above that of the shield.

4,250,419

HOLDER FOR OVERLOAD PROTECTOR

Charles T. Zolman, Zeeland, Mich., assignor to General Electric Company, Fort Wayne, Ind.

Filed Apr. 2, 1973, Ser. No. 347,073
Int. Cl.³ H02K *11/00*
U.S. Cl. 310—68 C **31 Claims**



1. A member for establishing a motor protector receiving pocket, said member being formed from a dielectric sheet material blank having a body portion and at least first and second flap portions extending in generally opposite directions from the body portion; a first one of the flap portions having first and second holes therein spaced apart and separated by a web of dielectric material; the first one of the flap portions being folded adjacent to each of the first and second holes therein with said web of dielectric material positioned against said body portion; and the second one of the flap portions having a terminal locking hole formed therein with the terminal locking hole being substantially totally surrounded by dielectric sheet material; a section of said dielectric sheet material immediately adjacent to the terminal locking hole being lanced along a line extending from the locking hole; the lanced section of sheet material being yieldable to permit relative movement between a protector terminal and the locking hole along said line; the sheet material adjacent to the locking hole and on each side of said line forming locking ears for retaining a protector terminal trapped in the locking hole; and wherein the first and second flap portions of said member are secured together by at least one ultrasonic weld.

4,250,420

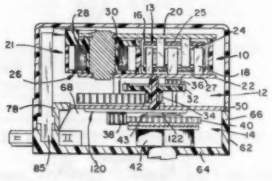
SANDWICH STRUCTURE FOR A COMBINATION MOTOR AND GEAR TRAIN WITH A TIMING MECHANISM

Neil E. Grah, Fairland, and Robert F. Weaver, Jamestown, both of Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Filed Oct. 15, 1979, Ser. No. 84,974
Claims priority, application Canada, Jun. 5, 1979, 329108
Int. Cl.³ H02K *7/10*
U.S. Cl. 310—83 **7 Claims**

1. In a combination of a motor, a gear train connected to an output of said motor, and a timing mechanism connected to an output of said gear train to be driven thereby, a packaging improvement for said combination characterized by:

(a) first and second field plates,
(b) a field coil, rotor and stator assembly disposed between said first and second field plates to provide a first sandwich structure,
(c) means connecting said field plates together including a post extending between and carried by said first and second field plates and a spacer plate connected at distal ends of said field plates at their ends opposite said post,
(d) a side wall substantially surrounding said first sandwich structure, said side wall including a first terminal block pivotally mounted on said post at an end thereof between an edge of said side wall and one of said first and second field plates, and first electrical terminals carried by said terminal block,
(e) a third plate disposed from said first sandwich structure



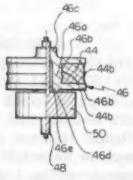
in spaced parallel relation therefrom and means holding said third plate in said spaced parallel relation,
(f) posts carried by and between said third plate and a plate of said first sandwhich structure, said gear train carried by said posts to provide a second sandwich structure,
(g) a second terminal block carried by said third plate substantially in line with said first terminal block, and bussing means connected to said first electrical terminals and extending through said second terminal block and including second electrical terminals,
(h) a cup shaped housing carrying said timing mechanism and having an open end, said cup shaped housing secured to said third plate at a surface opposite said second sandwich structure and at said open end to close same, and slot means in a wall of said cup shaped housing receiving said second electrical terminals.

4,250,421

ROTOR ASSEMBLY FOR STEPPING MOTOR

Katsuya Masuda, Tokyo, and Asao Saitou, Tokorozawa, both of Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Jun. 5, 1978, Ser. No. 912,274
Claims priority, application Japan, Jun. 7, 1977, 52-66966
Int. Cl.³ H02K *21/08*
U.S. Cl. 310—156 **10 Claims**



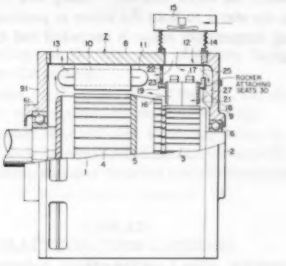
1. A rotor assembly for a stepping motor, comprising:
a rotor shaft;
a protecting member fixedly mounted on said rotor shaft and including a hub portion extending coaxially with said rotor shaft, and at least one face portion radially outwardly extending from the hub portion; and
a rotor magnet having an inner bore and an outer periphery each including an annular projection and etched areas, each of the annular projections being formed at a boundary between the etched areas, the annular projection of said inner bore engaging with the hub portion of said protecting member, whereby the rotor magnet is fixedly connected to the protecting member.

4,250,422

COOLING MEANS FOR ELECTRICAL ROTATING MACHINE

Kazuo Tahara, Hitachi; Fumio Tagima, Ibaraki; Shoji Motegi, Hitachi, and Shigeki Saito, Katsuta, all of Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Filed Sep. 2, 1977, Ser. No. 830,205
Claims priority, application Japan, Sep. 2, 1976, 51-104302
Int. Cl.³ H02K *9/28*
U.S. Cl. 310—227 **3 Claims**



1. In an electrical rotating device comprising a rotor containing an armature and a commutator disposed on a rotary shaft, said rotary shaft being supported within a yoke member, air inlets and air outlets disposed in said yoke member and means for introducing air through said air inlets and removing air through said outlets, the improvement which comprises;
a cooling device provided for said electrical rotating device including a cylindrically shaped rocker means terminating at one end in a disc-shaped flange, a bracket means, having a larger diameter than said disc-shaped flange, circumferentially disposed around said rotary shaft, radially extending rib means providing a fixed attachment of the bracket means with the disc-shaped flange of the rocker means, said bracket means and said disc-shaped flange defining therebetween a ventilation gap, and at least one brush means disposed in said rocker means and extending in the radially inward direction, said cooling device being disposed within the yoke of the electrical rotating device in close proximity to the air inlets and adapted to surround the commutator, thereby facilitating the flow of the cooling air from the air inlets through the open space formed between the outer circumference of the commutator and the brushes.

4,250,423

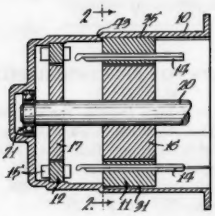
GENERATOR WITH STATOR RETENTION

Phillip S. Linscott, Jr., Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Aug. 25, 1978, Ser. No. 936,734
Int. Cl.³ H02K *1/12*
U.S. Cl. 310—258 **4 Claims**

1. A generator operable over a wide range of temperatures and having a housing of a lightweight metal with a stator mounted therein and a rotor mounted for rotation relative to the stator, said stator being formed of a metal having a lower thermal expansion rate than the housing metal and said stator having an outer surface engaging an inner surface of the housing with an interference fit throughout the operating temperature range of the generator, a plurality of longitudinal grooves

formed in one of said surfaces to permit bending of said housing in the area of said grooves when the generator is operating in the lower part of said temperature range, and means coact-



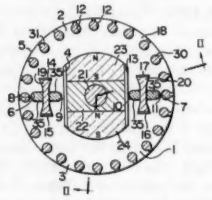
ing between the stator and the housing and exerting an axial force on the stator to hold the stator in position if the normal operating temperature range is exceeded and the interference fit is lost.

4,250,424

ROTOR OF SYNCHRONOUS MACHINES

Hiroshi Sento; Shoji Tanabe; Tadao Shimozu, all of Sakura; Seiji Yamashita, Katsuta, and Kunio Miyashita, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 26, 1978, Ser. No. 946,018
Claims priority, application Japan, Jan. 11, 1978, 53/1170
Int. Cl.[3] H02K *1/22*
U.S. Cl. 310—261 **6 Claims**



1. A rotor of synchronous machines comprising:

a rotor core including a multiplicity of laminations of blanked iron sheets each having segments divided by a plurality of slits, said segments corresponding in number to the number of poles, each of said blanked iron sheets having a center hole, and said laminations being made in such a manner that said holes and said slits of all of said blanked iron sheets are arranged in alignment at the same positions;

a plurality of permanent magnets which are received by said center holes of said blanked iron sheets so as to provide each pole constituted by said segments of said blanked iron sheets with a specific polarity;

a rotary shaft arranged in said center holes concentrically with said rotor core and adapted to rotate integrally with said rotor core and said permanent magnets;

a plurality of recesses formed in both sides of each of said slits and having a bottom wider than the opening; and

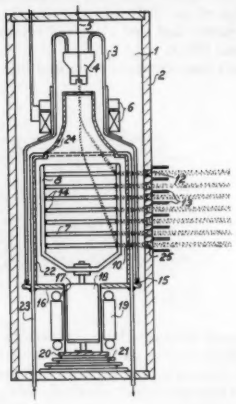
a plurality of key members with the ends thereof securely fitted with said recesses across said slits respectively.

4,250,425

ROTATING ANODE X-RAY TUBE FOR TOMODENSITOMETERS

Emile Gabbay; Dang Tran Quand, and Andre Lafitte, all of Paris, France, assignors to Compagnie Generale de Radiologie, Paris, France

Filed Jan. 23, 1979, Ser. No. 5,689
Claims priority, application France, Jan. 27, 1978, 78 02340
Int. Cl.[3] H01J *35/10, 35/04*
U.S. Cl. 313—60 **6 Claims**



1. An X-ray tube, for tomodensitometers in particular, containing:

a hallow, cylindrical rotating anode (**7**) functioning by transmission, with a support in the shape of a hollow cylindrical bell of material which absorbs little the X-rays emitted by a thin target of refractory material, which emits the X-rays and is deposited on the internal cylindrical surface of this support (**8**),

a collimation device (**10**) with several openings placed in front of the anode, the target of the said anode being swept, under the action of a deviation system (**6**), by a beam of electrons emitted by a cathode (**4**) so as to produce in cooperation with the collimation device a series of fine X-ray beams, which are roughly parallel and coplanar, the number of these beams being equal to the number of openings in the collimation device.

4,250,426

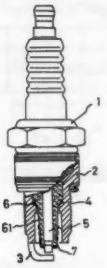
SPARK PLUG HAVING VANADIUM OXIDE ISLANDS ON CENTRAL INSULATOR

Koichi Nakajima, Nagoya; Tomoji Ishiguro, Aichi; Tokuhiko Okamoto; Minoru Konaka, both of Nagoya; Minoru Nagai, Kariya; Kanji Higuchi, Hekinan, and Kenji Sasaki, Kariya, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho and Nippondenso Co., Ltd., Aichi, Japan

Filed Oct. 12, 1978, Ser. No. 950,541
Claims priority, application Japan, Oct. 14, 1977, 52/123941
Int. Cl.[3] H01T *13/20*
U.S. Cl. 313—143 **4 Claims**

1. In an internal-combustion-engine spark plug having an insulator with a taper-nose portion which is exposed to combustion gases when the spark plug functions in a running internal-combustion engine and wherein the insulator provides electrical insulation between an axially-disposed electrode and

a surrounding casing, the improvement wherein the taper-nosed portion has an outer surface which is characterized by



the presence thereon of vanadium oxide islands having an average thickness of from 0.1 to 10 microns.

4,250,427

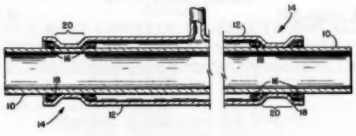
DYE LASER FLASHLAMP AND METHOD OF MAKING SAME

S. Edward Neister, Box G-2, New Durham, N.H. 03855

Filed Nov. 13, 1978, Ser. No. 959,755

Int. Cl.³ H01J *17/16, 17/18, 61/30*

U.S. Cl. 313—217 **3 Claims**



1. A method of making a coaxial flashlamp having spaced apart, concentrically arranged, inner and outer quartz tubes of different diameters and electrodes at each end of the tubes comprising the steps of: arranging a series of evenly circumferentially spaced strips of molybdenum joined at the strip ends by a pair of rings about the inner quartz tube at each end thereof; arranging the outer tube over the inner tube so that the strip ends of the outer tube overlay the arranged molybdenum strips; and circumferentially heat fusing the quartz tubes together in the regions of the molybdenum strips to form an impervious seal between the two tubes in the vicinity of the arranged molydenum strips.

4,250,428

BONDED CATHODE AND ELECTRODE STRUCTURE WITH LAYERED INSULATION, AND METHOD OF MANUFACTURE

David W. Oliver, Schenectady, and Casmir R. Trzaskos, Amsterdam, both of N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 9, 1979, Ser. No. 37,257

Int. Cl.³ H01J *1/88, 19/42*

U.S. Cl. 313—268 **19 Claims**

1. A bonded grid-cathode structure comprising:

a tungsten cathode having an emission impregnant;

a grid of a refractory metal;

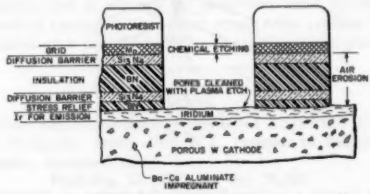
an insulator bonded to the cathode and to the grid, with openings through the grid and insulator to the cathode surface, wherein said insulator comprises a principal boron nitride (BN) layer and a relatively thin diffusion barrier of silicon nitride (Si_3N_4) bonded between the cathode and the BN layer to counteract the effects of diffusion of said impregnant into the insulator.

10. The method of forming a unitary heater, cathode, and control grid structure for an electron discharge device which comprises:

coating a disk of porous refractory metal with an inorganic insulating layer which includes a principal layer of BN,

overcoating the insulating layer with a film of refractory metal,

forming a grid pattern in the film on one side of the disk,



forming openings in the film and insulating layer corresponding to the pattern,

forming a heater on the other side of the disk, the disk being impregnant with thermionic emissive material,

the improvement wherein said insulating layer is formed with a diffusion barrier of Si_3N_4 to counteract diffusion of said thermionic emissive material into the insulating layer.

4,250,429

ELECTRON TUBE CATHODE

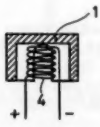
Bernhard Lersmacher, Aachen; Hans Lydtin, Stolberg; Horst Seifert, Hamburg, all of Fed. Rep. of Germany, and Johannes W. A. Krol, Valkenswaard, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 25, 1977, Ser. No. 845,274

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1976, 2650656

Int. Cl.³ H01J *1/13*

U.S. Cl. 313—346 R **19 Claims**



1. A cathode for an electron tube, said cathode comprising a support made of foamed carbon having a net-like structure and containing an emissive material.

4,250,430

MULTI-STAGE COLLECTOR FOR TRANSIT-TIME TUBES

Hinrich Heynisch, Graefelfing, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 20, 1978, Ser. No. 944,155

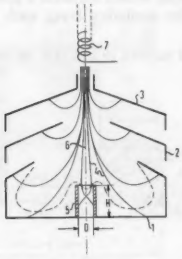
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1977, 274422

Int. Cl.³ H01J *23/02*

U.S. Cl. 315—5.38 **8 Claims**

1. A multi-stage collector for a transit-time tube such as a traveling wave tube comprising in combination, a hollow catcher element to catch the electron beam, said catcher element having a catcher plate adapted to intercept said electron beam, a plurality of electrodes surrounding said electron beam and spaced apart in an axial direction, said electrodes being adapted to be at different electrical potentials during operation of said tube, and a hollow cylindrical electrode for collecting

said electron beam arranged coaxially with the electron beam axis projecting into the catcher cavity, said cylindrical electrode having a surface formed of graphite or zirconium to reduce secondary electron emission.



4,250,431

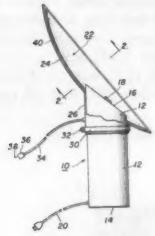
PARTICULATE COLLECTOR APPARATUS AND METHOD FOR ION GENERATORS

Joseph Sugarman, 628 Michelline La., Northbrook, Ill. 60062

Filed Dec. 26, 1979, Ser. No. 106,923

Int. Cl.[3] H05F *3/02*

U.S. Cl. 315—111.9 **4 Claims**



1. A collector apparatus for connection to an ion generator, which comprises:

an electrically conductive particle collector;

means for coupling said particle collector to ground; and

means for connecting said particle collector to an ion generator, whereby electrically charged particles adjacent the ion generator are attracted to said particle collector.

4,250,432

TOUCH DIMMER CIRCUIT

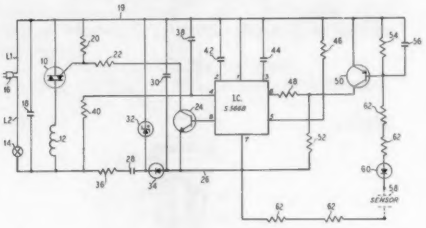
Thomas P. Kohler, Baldwinsville, N.Y., assignor to Beatrice Foods Co., Chicago, Ill.

Filed Apr. 16, 1979, Ser. No. 30,465

Int. Cl.[3] H05B *37/02*

U.S. Cl. 315—291 **10 Claims**

1. A touch sensitive dimmer control circuit incorporating a circuit means for controlling the phase of conduction of a thyristor interconnected in series with a load and a source of AC power, comprising in combination, a source of DC potential for powering said circuit means, an operating transistor having two terminals interconnected between a source of DC potential and an input terminal of said circuit means, bias means for maintaining said operating transistor in a first non-oscillating conducting state, a touch sensor, and a connecting circuit including said sensor for interconnecting a control terminal of said transistor with a DC reference potential electrically isolated from said AC power source, whereby operation of said touch sensor causes said operating transistor to assume a second non-oscillating conducting state.



4,250,433

VACUO SPARK GENERATOR FOR THE SPECTROGRAPHIC ANALYSIS OF SAMPLES

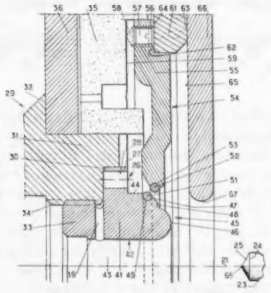
Claude R. Bernard, Longjumeau; Bernard Daigne, Chatillon, and Francois Girard, Paris, all of France, assignors to Office National d'Etudes et de Recherches Aerospatiales, Chatillon, France

Filed Feb. 5, 1979, Ser. No. 9,512

Claims priority, application France, Feb. 13, 1978, 78 03968

Int. Cl.[3] H01J *37/04*

U.S. Cl. 315—335 **14 Claims**



1. An in vacuo spark generator for the spectral analysis in the ultraviolet range of a sample acting as an anode, with, located in a chamber enclosing the sample, a coaxial annular cathode cooperating with the anode and an electrode for the formation of initiation sparks, the operative portion of which is disposed opposite the outer side surface of the cathode and set back relative to the frontal face of the cathode, wherein the cathode frontal face is rounded and the opposite portions of the cathode and the initiation electrode are provided each with removable snap-rings slightly protruding relative to the body of the cathode and initiation electrode, said snap-rings being housed in a semi-circular groove provided in the body of the cathode and the initiation electrode.

4,250,434

PRESSURE-RESPONSIVE ELECTRIC SWITCH

Jean Valansot, 14 re Cordemoy, Royat (Puy-de-Dome), France

Filed May 11, 1978, Ser. No. 904,887

Claims priority, application France, May 17, 1977, 77 15822

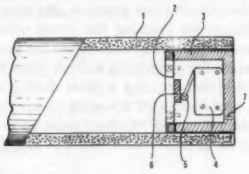
Int. Cl.[3] H01H *35/24;* **H05B** *37/00*

U.S. Cl. 315—362 **9 Claims**

1. A pressure-responsive electric switch assembly comprising:

A an elongated pneumatic tube having a circular cross section and formed of elastomeric cellular foam material impermeable to air, one end of the tube being sealed by a plug;

B a sleeve inserted in the other end of the pneumatic tube, the inner end of the sleeve being covered by a membrane to seal the other end of the tube, said tube having a relatively thick deformable wall thereby a slight manual pressure applied thereto gives rise to a substantial change in the internal volume of the sealed tube to dilate said membrane; and



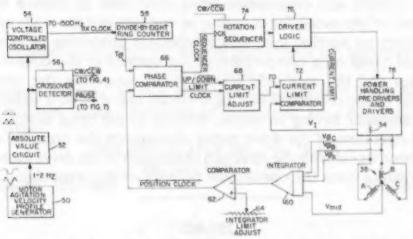
C a microswitch disposed within said sleeve and having an actuating element operatively coupled to said membrane whereby when said manual pressure is applied, said switch is actuated.

4,250,435

CLOCK RATE CONTROL OF ELECTRONICALLY COMMUTATED MOTOR ROTATIONAL VELOCITY

Robert P. Alley, Manlius, and Richard C. Weischedel, Camillus, both of N.Y., assignors to General Electric Company, Louisville, Ky.

Filed Jan. 4, 1980, Ser. No. 109,579
Int. Cl.³ H02P *6/02*
U.S. Cl. 318—138 **12 Claims**



1. A speed control system for an electronically commutated motor having a rotor and a plurality of stator windings operable to produce magnetic fields in response to selective winding energization, said system comprising:

a commutation sequencer operable to selectively energize the motor windings in a sequence appropriate for effecting motor rotor rotation, said commutation sequencer operable to advance step-by-step through the sequence as the rotor reaches each of a plurality of predetermined positions;

a storage device for storing a changeable representation of an established limit for motor winding current;

a controller responsive to said representation for limiting current through motor windings energized by said sequencer to the established limit;

a sensor for determining actual rotor position;

a source of periodic signals representative of desired rotor position and occurring at a rate proportional to desired rotational velocity, the time of occurrence of each individual one of the periodic signals representative of a particular instantaneous desired rotor position; and

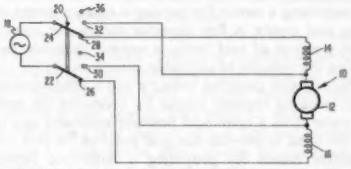
and adjustment element responsive to said sensor and to said periodic signal source, said adjustment element operable to periodically compare actual rotor position to desired rotor position and to decrease the established limit for motor winding current in the event actual rotor position leads desired rotor position by at least a predetermined amount, and to increase the established limit for motor winding current in the event actual rotor position lags desired rotor position by at least a predetermined amount.

4,250,436

MOTOR BRAKING ARRANGEMENT AND METHOD

Adrian Weissman, Jersey City, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Sep. 24, 1979, Ser. No. 78,333
Int. Cl.³ H02P *3/06*
U.S. Cl. 318—245 **7 Claims**



1. A method for braking a universal series motor connected to a source of electrical power, said motor having its brushes angularly shifted against the direction of motor rotation, the method comprising the steps of:

(a) disconnecting the motor from the source;

(b) connecting the source directly to the armature winding of the motor; and

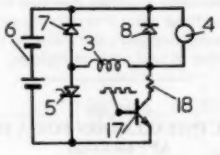
(c) disconnecting the source from the armature winding.

4,250,437

FIELD WEAKENING CIRCUITS FOR ELECTRIC MOTORS

John Morton, and Keith D. Stevens, both of Stockport, England, assignors to Cableform Limited, Stockport, England

Filed Apr. 17, 1979, Ser. No. 30,790
Claims priority, application United Kingdom, Apr. 17, 1978, 14926/78
Int. Cl.³ H02P *5/16*
U.S. Cl. 318—357 **5 Claims**

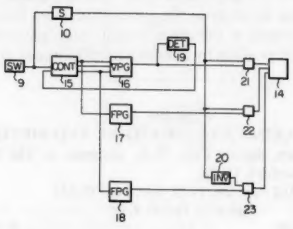


1. A power supply circuit for an electric motor including an armature in series with a field winding, comprising: a chopper circuit connected in series between the field winding and a power supply for supplying pulses of current from the power supply to said motor, and a field weakening circuit connected in parallel with the series connected field winding and chopper circuit, said field weakening circuit comprising at least one solid state switch in series with a resistor, wherein the impedance of said field weakening circuit may be controlled by varying the conductivity of said at least one solid state switch.

4,250,438
DIGITALLY CONTROLLED ACCELERATION AND DECELERATION SYSTEM

Fumio Onoda, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Mar. 7, 1978, Ser. No. 884,226
Int. Cl.³ G05B *13/00*
U.S. Cl. 318—561 **2 Claims**



1. A digitally controlled acceleration and deceleration system comprising a motor for moving a table, a motor drive for driving said motor, a first detector means for detecting the present position of said table, a second detector means for detecting the velocity of said table, circuit means for providing a product of said detected velocity and a predetermined constant τ, position register means for receiving an input command pulse from a command position apparatus and accumulating the same to provide the goal position for said table, first comparator means for providing a difference between the output of said position register means and said first detector means, and a second comparator for providing a difference between the output of said first comparator means and the output of said circuit means, characterized in that said command position apparatus comprises;

(a) variable pulse generator means for providing a pulse train whose frequency during an acceleration mode increases from zero to a predetermined frequency F at a constant rate F/a; during a constant speed mode said frequency F is maintained; in a deceleration mode said frequency decreases from F to zero at a constant rate F/b; and in an acceleration mode said frequency increases at a constant rate F/a until the beginning of the deceleration mode, and in the deceleration mode said frequency decreases to zero at a constant rate F/b,

(b) first fixed pulse generator means for providing a pulse train at a frequency τ·F/a in the acceleration mode,

(c) second fixed pulse generator means for providing a pulse train at a frequency τ·F/b in the deceleration mode,

(d) means for providing a moving direction to the pulse train of said variable pulse generator means,

(e) means for providing a moving direction to the pulse train of said first fixed generator means,

(f) means for providing a moving direction to the pulse train of said second fixed pulse generator means, and

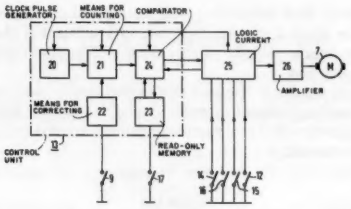
(g) means for combining said pulse trains for providing input command pulses to said position register.

4,250,439
CONTROL INSTALLATION FOR A DENTAL APPARATUS

Eugen Hohmann, Bensheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 31, 1978, Ser. No. 929,344
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1977, 2736276
Int. Cl.³ G05B *19/29*
U.S. Cl. 318—601 **3 Claims**

1. In a control installation for a dental treatment chair which has at least one part capable of being moved to a selected position of a plurality of positions, said part being selected from a seat moveable to different heights and a back rest having changeable inclinations, said control installation including a drive motor for moving said part to the selected position, means for generating actual value indications based on the actual position of the part, means for producing a nominal value indication for the selected position, means including a comparator for comparing the actual value indication and the nominal value indication and creating an electrical signal for operating said drive motor in the necessary direction to move the part to the selected one position, the improvements comprising the means for creating the actual value indication including means for counting and means for generating a clock pulse, said means for generating a clock pulse being coupled to the drive motor and creating a pulse during operation of the drive motor, said means for counting receiving said pulse and adding or subtracting the received pulse to the existing count depending on the direction of rotation of said drive motor, said



means for providing the nominal value indication comprises an electronic read-only memory providing a nominal value indication, said comparator having an output connected to a combinational logic circuit, said combinational logic circuit checking the switching command from program switches and transmitting said commands to the memory, said combinational logic circuit blocking transmission of the switching commands when conflicting and transmitting the commands when they are correct, said comparator being connected to receive the output of the means for counting on one side and the read-only memory on another side, said comparator producing an error signal based on a comparision of the outputs of the counting means and the read-only memory and supplying the error signal to the combinational logic circuit and then to a switching amplifier having an output directed to the drive motor so that operation of the drive motor depends on the presence of an error signal with the direction of rotation of the drive motor depending upon the operational polarity of the error signal.

4,250,440
MULTIPLE-PURPOSE CLOSED-LOOP, AUTOMATIC CONTROL SYSTEM

Yu-Kuang Lee, No. 596, Chung Cheng Rd., Chu Pei, Hsin Chu Hsien, Taiwan

Filed Aug. 10, 1977, Ser. No. 823,462
Int. Cl.³ G05B *5/01*
U.S. Cl. 318—614 **12 Claims**

1. A multiple-purpose, closed-loop, automatic control system comprising:

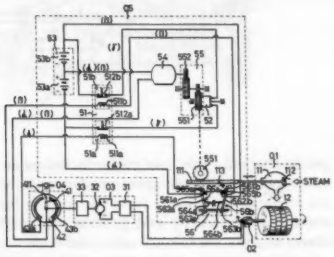
a system controlled, said system producing as an output a controlled variable, and said system including a regulating means for selectively adjusting said controlled variable;

a detecting means for detecting the controlled variable output from the system controlled and for converting the controlled variable into an electrical feedback signal representative of said controlled variable;

a signal converting means for receiving the electrical feedback signal produced by said detecting means and for converting said signal into an angular displacement representative of the controlled variable, said signal converting means including a balancing motor for producing a rotary

movement corresponding to said electrical feedback signal and means for converting said rotary movement into said angular displacement representative of the controlled variable;

a comparing means for receiving the angular displacement representative of the controlled variable produced by said signal converting means and for comparing the angular displacement representative of the controlled variable with an angular displacement representative of a preset desired value and selectively opening or closing a forward or reverse controlling circuit; and



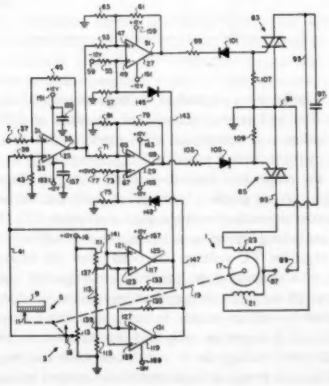
a controlling means for automatically controlling the system controlled so as to keep the controlled variable within the preset desired value, said controlling means including the forward and the reverse controlling circuit selectivity opened or closed by said comparing means, a braking control circuit and a driving mechanism responsive to said forward and reverse controlling circuits and said braking control circuit, wherein said driving mechanism selectively operates the regulating means of the system controlled whenever the angular displacement representative of the controlled variable is not within the angular displacement representative of the preset desired value in order to selectively adjust said controlled variable.

4,250,441

SERVO APPARATUS WITH ELECTRICAL MOTION LIMITING

James Chapman, Airdrie, Scotland, and James W. Ratz, Bloomington, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 9, 1979, Ser. No. 19,131
Int. Cl.[3] G05G 5/00
U.S. Cl. 318—626 **6 Claims**



1. In servo apparatus including a feedback device having an element which is positionable along a path and which produces a first voltage which represents the position of said element along said path, a motor coupled to said element for moving the latter along said path in response to motor drive signals fed to said motor, and motor drive means for comparing said first voltage to an apparatus input voltage to feed said motor with upscale and downscale motor drive signals which cause said motor to move said element in the direction and to the extent needed to bring said element position and said first voltage into correspondence with said input voltage, the improvement for electrically limiting the range of movement of said element, comprising

means connected to a source of voltage to establish a second voltage which bears a preselected relationship to said first voltage when said element is at a preselected downscale travel limit position along said path, and to establish a third voltage which bears a preselected relationship to said first voltage when said element is at a preselected upscale travel limit position along said path,

a first voltage comparator connected to receive and compare said first and second voltages to produce in an output a first motor drive modifying signal when the comparison of said first and second voltages indicates that said element is at said downscale limit position,

a second voltage comparator connected to receive and compare said first and third voltages to produce in an output a second motor drive modifying signal when the comparison of said first and third voltages indicates that said element is at said upscale limit position, and

means connecting said outputs of said first and second comparators to said motor drive means to cause said first modifying signal to modify the application of said downscale motor drive signal to said motor, and to cause said second modifying signal to modify the application of said upscale motor drive signal to said motor,

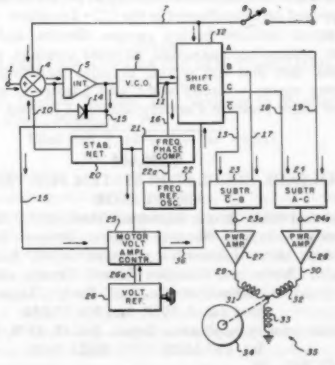
thereby to limit the range of movement of said element along said path to that lying between said two limit positions.

4,250,442

STABLE SYNCHRONOUS DRIVE SYSTEM FOR GYROSCOPE ROTOR

William W. McCammon, Merrick, N.Y., assignor to Sperry Corporation, New York, N.Y.

Filed Oct. 4, 1979, Ser. No. 81,728
Int. Cl.[3] H02P 1/46, 1/52, 5/34
U.S. Cl. 318—723 **9 Claims**



1. Control apparatus for operating synchronous motor means of the kind having a normal inherent synchronous rotation speed, said control means comprising:

summation means having output means and first and second input means,

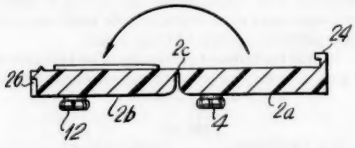
said first input means being adapted to receive a first signal of predetermined amplitude,
integrator means responsive to said output means,
voltage-controlled oscillator means responsive to said integrator means,
stable frequency reference means,
edge-triggered frequency-phase detector means responsive to said voltage-controlled oscillator means and to said stable frequency reference means for generating an error signal coupled to said second input means,
voltage amplitude control means responsive to said edge-triggered frequency-phase detector means and to said integrator means,
pulse generator means responsive to said voltage controlled oscillator means and to said voltage amplitude control means for generating a plurality of phase displaced pulse trains, and
combining means for combining in a predetermined manner pairs of said plurality of phase displaced pulse trains,
said synchronous motor means being responsive to said combining means.

4,250,443

BATTERY CHARGER ADAPTER INCLUDING SNAP TYPE ASSEMBLY MEANS

Raymond K. Sugalski, Gainesville, Fla., assignor to General Electric Company, Gainesville, Fla.

Filed Dec. 22, 1978, Ser. No. 972,254
The portion of the term of this patent subsequent to Jul. 8, 1997, has been disclaimed.
Int. Cl.³ H01M *2/26, 10/46*
U.S. Cl. 320—2 **3 Claims**



1. A charging adpater comprising a molded, insulating, unitary housing having first and second portions interconnected by an integral hinge at abutting edges thereof, whereby said portions may be folded over into abutting juxtaposition; said first and second portions having terminal contacts thereon on opposed surfaces thereof in the folded position, the interior juxtaposed surfaces having cavities therein, and electrical means connecting associated terminal contacts within said cavities, said first and second portions including snappable grasping means whereby when said adapter is snapped together under pressure a unitary adapter is formed.

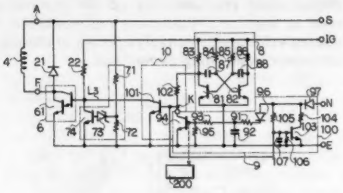
4,250,444

VOLTAGE REGULATOR SYSTEM FOR VEHICLE GENERATOR

Katsutaro Iwaki, Chiryu; Kazumasa Mori, Aichi; Akira Mase, Handa; Takayasu Nimura, Nagoya; Katsumi Itoh, Oobu; Yoshio Akita, Ichinomiya; Katsuya Muto, Kariya; Taro Asahi, Chiryu, and Keiichiro Banzai, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 5, 1979, Ser. No. 55,034
Claims priority, application Japan, Jul. 11, 1978, 53-84848
Int. Cl.³ H02P *9/30;* **H02J** *7/14*
U.S. Cl. 322—28 **4 Claims**

1. A voltage regulator for an automobile battery charging system including a key switch and generator with a field exciting coil and armature windings comprising:
a switching circuit connected to said field exciting coil in a controlled manner,
a battery voltage sensing circuit connected between said battery and said switching circuit for controlling the switching operation of said switching circuit and
means connected between at least one of said armature windings and said switching circuit for controlling said switching circuit to limit said field exciting current when a voltage generated by said generator is lower than a



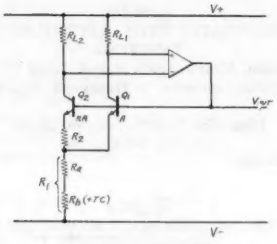
predetermined value, said means including an input circuit having a low and high input impedance circuits for changing its input impedance from the low to high when the voltage generated by said generator is greater than the above said predetermined value, and from the high to low when the voltage generated by said generator is lower than said predetermined value.

4,250,445

BAND-GAP VOLTAGE REFERENCE WITH CURVATURE CORRECTION

Adrian P. Brokaw, Burlington, Mass., assignor to Analog Devices, Incorporated, Norwood, Mass.

Filed Jan. 17, 1979, Ser. No. 4,014
Int. Cl.³ G05F *1/58*
U.S. Cl. 323—313 **5 Claims**



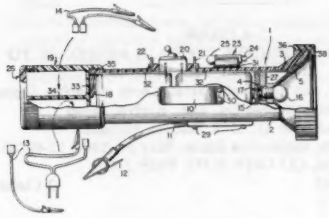
1. In a solid-state regulated voltage supply of the type including first and second transistors operated at different current densities and connected with associated circuitry to develop a current with a positive TC proportional to the difference in the respective base-to-emitter voltages of said transistors, said current passing through at least one resistor to develop a corresponding voltage with a positive TC, the voltage supply including means combining said positive TC voltage with a negative TC voltage, derived from the base-to-emitter voltage of a transistor, to provide a composite temperature-compensated output voltage; that improvement comprising:
additional resistor means in said associated circuitry and connected in series with said one resistor to produce an additional voltage to be combined with said negative TC voltage to produce said composite output voltage;
said additional resistor means having a temperature coefficient that is more positive than that of said one resistor.

4,250,446

COMBINATION FLASHLIGHT AND CIRCUIT TESTER

Raymon Ponte, 16516 Kipling Rd., Rockville, Md. 20855

Filed Jan. 4, 1979, Ser. No. 804
Int. Cl.[3] G01R *31/00*; F21L *7/00*
U.S. Cl. 324—53 14 Claims



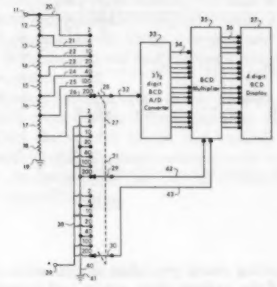
1. A combination flashlight and circuit tester, comprising:
(a) A generally tubular housing for receiving a plurality of flashlight batteries end to end in electrical contact;
(b) a screw-on lens at a first end of the housing;
(c) a removable cap at a second, opposite end of the housing;
(d) a reflector-light bulb assembly retained within the housing adjacent the screw-on lens;
(e) an annular contact plate circumferentially engaging the reflector;
(f) a discoidal battery contact plate interposed between and in direct contact with the bulb and the battery;
(g) resilient means disposed within the housing adjacent the removable cap for urging the batteries into electrical contact with the discoidal contact plate;
(h) electrical conductor means within the housing extending between the resilient means and the annular contact plate, comprising first and second electrically conductive metal bars disposed within the housing and spaced in an end to end relationship, the first bar extending from the annular contact plate toward the second bar and the second bar extending from the resilient means toward the first bar, the switch interconnecting the adjacent ends of the bars and said conductor means further including a switch for alternatively conducting or interrupting electrical current flow through an electrical circuit comprising the conductor means, the annular contact plate, the reflector, the bulb, the discoidal contact plate, the batteries and the resilient means;
(i) said conductor means including means for making an electrical connection with a circuit to be tested for electrical continuity wherein the conductor means and the connection means comprises a pair of spade connectors, one electrically connected to each bar on an opposite side of the switch, both spade connectors extending through the housing wall and projecting radially beyond the exterior surface of the housing a sufficient distance to be manually engaged and to facilitate connection with an exterior circuit, said switch being removably interconnected with each of the bars by engaging its second spade connector, whereby the switch may be readily replaced upon failure; and
(j) means for supporting the flashlight/tester in any of a variety of positions comprising an elongate flexible metal rod attached at one end to the exterior surface of the housing and having a clamp at its opposite end, the rod being manually bendable to a variety of orientations but sufficiently resistant to bending to support the flashlight/tester from whatever structure to which it is clamped while maintaining the selected orientation.

4,250,447

DIGITAL MULTIMETER WITH MORE CLOSELY SPACED RANGES

Tenny D. Lode, 1317 E. Belleview Ave., Littleton, Colo. 80121

Filed Sep. 21, 1978, Ser. No. 944,588
Int. Cl.[3] G01R *15/08*
U.S. Cl. 324—115 6 Claims



1. A multirange meter for the digital measurement of an analog signal including range selection means having a plurality of selectable measurement ranges;
first means connected to said range selection means to receive the analog signal and to attenuate the analog signal and to provide an attenuated analog output signal as a function of the range selected by the range selection means;
converting means coupled to receive and to convert each attenuated analog output signal into a digital signal having a predetermined number of measurement steps;
control means generating a control signal which changes as a function of the range selected by said range selection means;
multiplying means to receive said digital signal from said converting means and interconnected with said control means for multiplying said digital signal from said converting means by a function determined by the control signal provided for that particular range and which is a different multiplier for each of a plurality of the selectable ranges; and
display means to display a digital representation of said multiplied digital signal from said multiplying means.

4,250,448

VOLTMETER APPARATUS FOR CASCADED TRANSFORMERS

Michael G. Daniels, Muncie, Ind., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

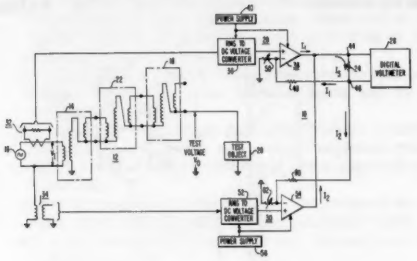
Filed Feb. 7, 1979, Ser. No. 10,113
Int. Cl.[3] G01R *1/20*
U.S. Cl. 324—127 2 Claims

1. Voltmeter apparatus for measuring the output voltage of a cascade connected transformer having an input unit adapted for connection to a source of alternating potential, an output unit adapted for connection to a load circuit, a nominal ratio V_N and an actual ratio RT defined by the linear equation $RT=a\lambda+b$, wherein "a" is the slope, "b" is the y-axis intercept, and λ is the admittance of the input unit, comprising:
first means including current transformer means having a predetermined ratio R_{CT}, said first means providing a first unidirectional current responsive to the current flowing in the input unit scaled by a first predetermined constant;
second means including potential transformer means having a predetermined ratio R_{PT}, said second means providing a second unidirectional current responsive to the voltage applied to the input unit scaled by a second predetermined constant;

said first predetermined constant being equal to $aR_{CT}/(R_{PT}^2 \cdot V_N)$;

said second predetermined constant being equal to $(b/R_{PT} \cdot V_N)$;

impedance means providing a voltage drop responsive to the sum of said first and second currents;



and indicating means providing an indication of the magnitude of the voltage drop across said impedance means, wherein the magnitude of said voltage drop is responsive to the voltage across the output unit of the cascade connected transformers.

4,250,449

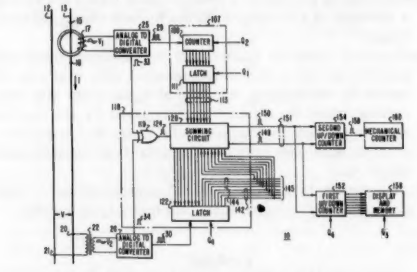
DIGITAL ELECTRIC ENERGY MEASURING CIRCUIT

Lanson Y. Shum, Delmont, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 24, 1978, Ser. No. 963,618

Int. Cl.[3] G01R *21/06*

U.S. Cl. 324—142 **9 Claims**



1. A digital electric energy measuring circuit comprising:

first input means responsive to a first analog signal representative of a current component and having positive and negative portions;

second input means responsive to a second analog signal representative of a voltage component and having positive and negative portions;

means producing a plurality of clock pulse signals each having a predetermined frequency;

sampling means producing binary coded sample signals in response to a first clock pulse signal, said signals varying in response to the variations of said first analog signal;

analog to frequency converter means producing a pulse train signal having a pulse repetition rate substantially faster than the frequency of said first clock pulse signal and varying in response to variations of said second analog signal;

addition means having at least two data inputs, a triggering input, and a data output producing a data output signal, one of said data inputs being responsive to said sample signals, the other of said data inputs being responsive to said data output signal, said triggering input being responsive to said pulse train signal to produce at said data output the data output signal responsive to the sum of the signals at said data inputs such that said data output signal represents the product of said first and said second analog signals occurring between the clock pulses of said first clock pulse signal; and

means for totalizing and displaying said data output signal responsive to said addition means.

4,250,450

DETECTION OF ENGINE SPEED IN RESPONSE TO IGNITION OPERATION

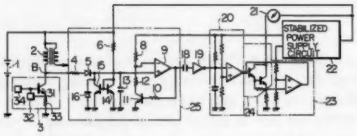
Koukiti Yamada, and Katsuyuki Miyake, both of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 17, 1978, Ser. No. 907,052

Claims priority, application Japan, May 24, 1977, 52-60285

Int. Cl.[3] G01P *3/481;* F02P *1/00*

U.S. Cl. 324—169 **2 Claims**



1. A system for detecting engine speed comprising:

a power source for supplying voltage to said system;

an engine ignition coil joined at one of its ends to said power source;

switching means connected between the opposite end of said coil and ground, said switching means including a switching transistor operable between on and off conditions to control the flow of current from said power source through the ignition coil and the switching transistor to ground, said switching means further including: a speed signal generating circuit joined to the switching transistor and responsive to the speed of said engine for switching said transistor on and off at a rate dependent on engine speed, and a current limiting circuit for limiting the flow of current through said switching transistor to a predetermined value;

circuit means connected to said power source and to a junction point at which said ignition coil and said switching means are joined, said circuit means including voltage control means for producing a threshold value voltage which is variable in response to variations of the voltage of said power source, said circuit means generating pulses when the voltage at said junction exceeds the threshold value voltage as the transistor is switched on and off, said pulses thereby being synchronized with the engine speed; and

means connected to said circuit means and responsive to said pulses for indicating the engine speed.

4,250,451

MAGNETIC INDUCTION IMAGING SYSTEM

Glenn B. Slagle, McLean, Va., assignor to Cordless Power Corporation, McLean, Va.

Filed Dec. 28, 1978, Ser. No. 973,873

Int. Cl.[3] G01R *33/00;* G01N *27/72*

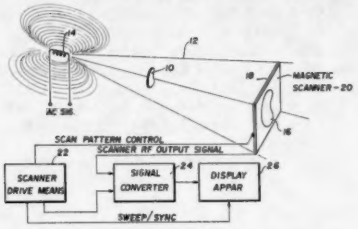
U.S. Cl. 324—239 **15 Claims**

1. A point source projection magnetic induction imaging system for producing a visual display of a magnetic shadow or silhouette image of the external geometry of an object immersed in a magnetic induction field, comprising, in combination:

means generating a single non-scanning magnetic induction field point source relative to the size of said object and the respective distances of said point source and said object

away from a reference plane, said reference plane being located behind said object a predetermined distance and substantially perpendicular to the axis of symmetry of the magnetic field transmitted from said point source wherein the mean transverse cross-sectional angle subtended by the source from a point in said reference plane is less than one-third the mean transverse cross-sectional angle subtended by the object from the same point in said reference plane;

magnetic receiver means, including means for providing a scanning operation thereof relative to said non-scanning point source, located at said reference plane and being operable to be responsive primarily to primary field variations of said point source induction field to thereby sense the magnetic shadow or silhouette image of said object cast on said reference plane, as opposed to responding primarily to secondary fields caused by eddy currents induced in said object, and outputting electrical signals accordingly;



electrical circuit means coupled to said receiver means and being responsive to said electrical signals during said scanning operation of said receiver means to produce imaging producing electrical signals therefrom; and

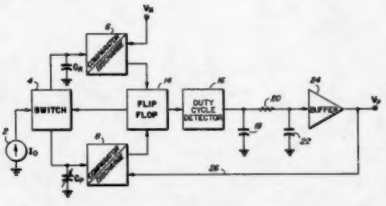
visual display means coupled to said electrical circuit means and being responsive to said image producing electrical signals to produce a visual image of said magnetic shadow image.

4,250,452

PRESSURE SENSITIVE TRANSDUCER CIRCUITS

Randall C. Gray, Scottsdale, and W. David Pace, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 19, 1979, Ser. No. 31,884
Int. Cl.³ H03K *3/26;* **G01N** *27/00*
U.S. Cl. 328—1 **9 Claims**



1. An apparatus for generating a voltage which is inversely proportional to the capacitance of a variable capacitor, comprising:

a reference capacitor;

first means coupled to said reference capacitor and to said variable capacitor for alternately charging and discharging said reference capacitor and said variable capacitor; and

second means coupled to said first means for generating a feedback voltage at which said variable capacitor discharges, said feedback voltage attaining a magnitude inversely proportional to the capacitance of said variable capacitor;

said first means comprising:

third means for alternately directing current to said reference capacitor and said variable capacitor;

first comparing means coupled to said third means and to said reference capacitor for altering the state of said third means when the voltage across said reference capacitor reaches a predetermined value whereby said reference capacitor is discharged and said current is directed to said variable capacitor; and

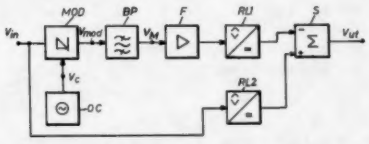
second comparing means coupled to said third means and to said variable capacitor for altering the state of said third means when the voltage across said variable capacitor reaches said feedback voltage whereby said variable capacitor is discharged and said current is directed to said reference capacitor.

4,250,453

NARROW BAND LEVEL DETECTOR FOR DETECTING A PERIODIC SIGNAL

Lars K. Nilsson, Norsborg, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Feb. 23, 1979, Ser. No. 14,742
Claims priority, application Sweden, Mar. 10, 1978, 7802765
Int. Cl.³ H03K *9/06;* **H03B** *1/04*
U.S. Cl. 328—138 **1 Claim**



1. A narrow band level detector for detecting, from an incoming signal to the detector, the level of periodic signal having a certain frequency of a number of disturbing especially periodic signals, the frequency components of which have their frequency positions within a side band of the periodic signal, comprising

a circuit device to generate a periodic signal with a predetermined amplitude and a predetermined frequency equal to the frequency of said periodic signal,

a modulator device connected to form the product of said incoming signal and said periodic signal,

a filter device connected to said modulator device for recovering the frequency components of said number of disturbing periodic signals,

an amplifier device connected to said filter device, and having a predetermined and for each of said frequency components constant phase shift for multiplying said components with a predetermined value,

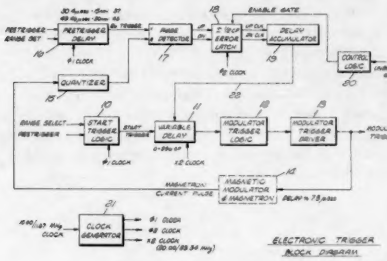
a first and a second peak value rectifier connected respectively to said amplifier device, and said incoming signal to form the peak value of the signal obtained from said amplifier device and to form the peak value of the incoming signal respectively, and

a differential circuit connected to form the difference between the peak values, obtained from said rectifier, the difference representing a measure of the desired level of the periodic signal.

4,250,454
ELECTRONIC TRIGGER FOR A RADIO FREQUENCY SOURCE

Norman Y. Sakamoto, Los Angeles, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 26, 1979, Ser. No. 23,823
Int. Cl.[3] H03K 5/26
U.S. Cl. 328—155 13 Claims



ELECTRONIC TRIGGER BLOCK DIAGRAM

1. An electronic trigger controller for an RF source, said controller being responsive to a trigger signal and comprising:

a. a register;

b. means responsive to said trigger signal for enabling counting in said register in response thereto;

c. means responsive to a selected count in said register for enabling said RF source;

d. means for generating a timing signal in a timed relationship to the time which said RF source should nominally generate its RF signal;

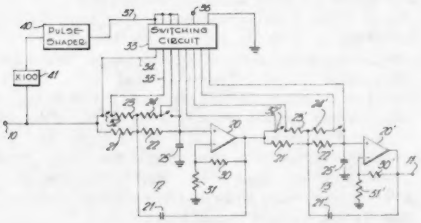
e. means for comparing the phase relationship between the occurrence of said timing signal and the initiation of said RF signal; and

f. means responsive to said comparing means for altering the number of states through said register counts when enabled by said trigger.

4,250,455
SQUARE WAVE/SINE WAVE CONVERSION

Bryce D. Davis, Sackville, Canada, assignor to Her Majesty the Queen in right of Canada, Ottawa, Canada

Filed Aug. 25, 1978, Ser. No. 936,801
Claims priority, application Canada, Nov. 2, 1977, 290049
Int. Cl.[3] H03B 1/00
U.S. Cl. 328—167 4 Claims



1. A square wave to sine wave converter having an input terminal adapted to receive a square wave at an input frequency and an output terminal adapted to provide a sine wave at an output frequency, comprising:

a low pass filter connected between the input terminal and the output terminal, said low pass filter including an impedance whose effective value is determined by the input frequency of the square wave, the effective value of the impedance subsequently determining a cut-off frequency for said low pass filter;

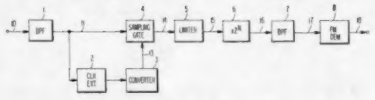
switching means connected to said impedance for modifying the value thereof, said switching means including a switch and said impedance in parallel with a series arrangement of a resistor and said switch; and

generating means connected between the input terminal and the switching means, said generating means being operable to produce a train of narrow pulses for actuating said switch at a rate equal to a multiple of the input frequency of said square wave.

4,250,456
DEVICE FOR DEMODULATING PSK-FM DOUBLE MODULATED CARRIER SIGNALS

Saburo Shinmyo, and Yoichi Tan, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 14, 1979, Ser. No. 20,588
Claims priority, application Japan, Mar. 14, 1978, 53-29599
Int. Cl.[3] H03D 3/00
U.S. Cl. 329—50 1 Claim



1. A demodulator for a double-modulated carrier signal in which the carrier signal is 2^N-phase-modulated by a main signal and then frequency-modulated by a sub-signal comprising:

means for extracting a clock component from said double-modulated carrier signal;

means for sampling said double-modulated carrier signal in accordance with the output of said extracting means;

means for limiting an amplitude of the output of said sampling means;

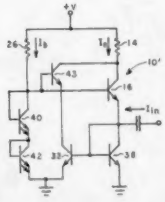
means for frequency-multiplying the output of said limiting means by 2^N; and,

means for demodulating a frequency-modulated signal from said frequency-multiplying means.

4,250,457
FULL WAVE RECTIFIER ENVELOPE DETECTOR

Judson A. Hofmann, Schaumburg, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Mar. 5, 1979, Ser. No. 17,526
Int. Cl.[3] H03D 1/18; H02M 7/217
U.S. Cl. 329—101 27 Claims



1. An envelope detector for developing a fully rectified output signal in response to a low level input signal, comprising:

first transistor means having an input terminal and an output terminal, adapted to receive the input signal at said input terminal, and conducting a predetermined bias current such that a half-wave rectified version of the input signal is developed at said output terminal;

second transistor means having an input terminal receiving the input signal, having an output terminal coupled to the output terminal of said first transistor means, and arranged in a circuit configuration such that said second transistor means develops at its output a half-wave rectified version of the input signal on cycles of the input signal alternate to those rectified by said first transistor means; and

third transistor means coupled to said second transistor means and receiving the bias current for causing said second transistor means to have substantially the same gain and to conduct substantially the same bias current as said first transistor means,

whereby said first and second transistor means conduct at corresponding phase angles of alternate half-cycles of the input signal and develop a substantially linear, fully-rectified output signal which is free of switching transients and whose gain is substantially uniform.

4,250,458

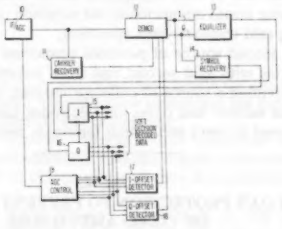
BASEBAND DC OFFSET DETECTOR AND CONTROL CIRCUIT FOR DC COUPLED DIGITAL DEMODULATOR

Robert L. Richmond, Frederick, and Paul F. Wyar, Mt. Airy, both of Md., assignors to Digital Communications Corporation, Gaithersburg, Md.

Filed May 31, 1979, Ser. No. 44,143

Int. Cl.[3] H03D *3/00*; H04L *27/22*

U.S. Cl. 329—112 **6 Claims**



1. A DC offset detector for a DC-coupled digital demodulator generating an information bearing analog signal of controlled peak-to-peak amplitude and a symbol clock comprising:

soft-decision demodulating means responsive to said analog signal and to said symbol clock for providing a repetitive multi-bit output, each such multi-bit output representing polarity and amplitude of said analog signal at different points in time,

logic means responsive to said multi-bit output for producing a logic signal of a first type if said multi-bit output represents either an analog signal of one polarity and greater in amplitude than a predetermined amplitude, or an analog signal of other polarity and amplitude less than an equal predetermined amplitude of said other polarity, and

means responsive to said logic means for producing a control signal representative of deviations of said logic signal of a first type from 50% duty cycle.

4,250,459

CIRCUIT ARRANGEMENT FOR AUTOMATIC DISTORTION CORRECTION OF A SIGNAL

Adolf Haass, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 26, 1979, Ser. No. 15,204

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1978, 2810504

Int. Cl.[3] H03G *9/24*

U.S. Cl. 330—145 **1 Claim**

1. A circuit arrangement for automatic distortion correction of signals transmitted over a line which has a low-pass filter characteristic, comprising:

an input for receiving signals;

a distortion corrector including

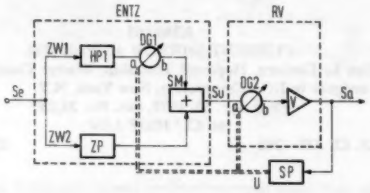
a high-pass filter having a predetermined frequency characteristic,

a controllable first attenuator connected in series with said high-pass filter forming a first branch,

a two-terminal network having a predetermined frequency characteristic forming a second branch,

a common input terminal for said first and second branches, and

summing means connecting and forming a common output for said first and second branches;



a controlled-gain amplifier connected in series with said distortion corrector and including

an amplifier having a predetermined amplification, and

a controllable second attenuator connected in series with said amplifier, said first and second attenuators having similar current/voltage characteristics;

an output for said circuit arrangement for providing a distortion-corrected signal; and

control means connected between said output and said first and second attenuators for deriving a single control voltage for simultaneously controlling said attenuators in accordance with the distortion-corrected signal.

4,250,460

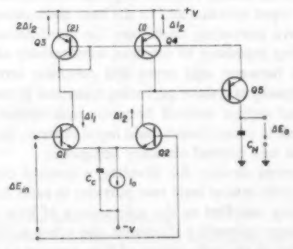
SLEW RATE CONTROL

Frank Gasparik, Indialantic, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Jan. 30, 1979, Ser. No. 7,750

Int. Cl.[3] H03F *3/45*

U.S. Cl. 330—252 **8 Claims**



1. In an operational amplifier circuit comprising a differential amplifier means providing an output current in response to a differential input voltage, a current source, and a compensating capacitance means receiving said output current, the improvement comprising slew rate control means comprised of additional capacitance means electrically connected to said differential amplifier means, said additional capacitance, C_D being dimensioned according to the following equation.:

$$C_c = \sqrt{\frac{36 - 4w_1^2 h_{ib}^2 C_H^2}{w_1^4 h_{ib}^4 C_H^2 - 4w_1^2 h_{ib}^2}}$$

where

w_1=amplifier bandwidth set equal to the maximum small signal bandwidth

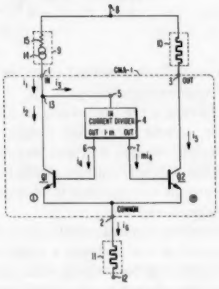
C_H=compensating capacitance and h_{ib}=common base hybrid parameter, whereby the amplifier slew rate is raised to its maximum slew rate determined by its small signal response.

4,250,461

CURRENT MIRROR AMPLIFIER

Allen L. Limberg, Hopewell Township, Mercer County, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 20, 1979, Ser. No. 31,837
Int. Cl.³ H03F 3/04
U.S. Cl. 330—288 **21 Claims**



1. In a current mirror amplifier of the kind comprising an input terminal to which an input signal current to be amplified is applied, and output and common terminals coupled to respective supply voltage terminals, one such coupling being via a load impedance, a master mirroring transistor of a given conductivity type connected at its collector and emitter electrodes to said input and common terminals, respectively, a slave mirroring transistor of said given condictivity type connected at its collector and emitter electrodes to said output and common terminals, respectively, and control circuitry coupled to said input terminal and to the base electrodes of said master and slave mirroring transistors for conditioning said master mirroring transistor to conduct substantially all of said input current between said input and common terminals and for conditioning said slave mirroring transistor to conduct a predetermined output current between said output and common terminals in proportion to said input current, the improvement wherein said control circuitry comprises:

a current divider for dividing a control current supplied thereto into at least two portions in ratio 1:m, one portion being supplied as the sole source of base current to the master mirroring transistor, the other portion being supplied as the sole source of base current to said slave mirroring transistor; and

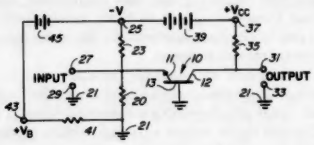
circuit means for supplying said control current to said current divider in proportion to the magnitude of the input signal current supplied to said input terminal of said current mirror amplified, said transistors exhibiting substantially equal current gains for rendering the overall input-output current ratio of said current mirror amplifier dependent solely upon said ratio of said current divider.

4,250,462

COMMON BASE CONNECTED TRANSISTOR AND BIAS NETWORK

Herbert W. Iwer, Tempe, Ariz., and Johnnie J. Cochran, Plano, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 11, 1979, Ser. No. 28,956
Int. Cl.³ H03F 3/19
U.S. Cl. 330—296 **11 Claims**



1. A common base connected transistor and bias network comprising:

(a) a transistor having base, emitter and collector electrodes with the base electrode being connected directly to a common potential;

(b) first impedance means connected between and in series with the emitter electrode and the common potential;

(c) second and third impedance means connected to the emitter and collector electrodes, respectively;

(d) a first source of potential connected between and in series with said second impedance means and a fourth impedance means connected to the common potential for biasing said transistor into operation;

(e) a second source of potential connected between and in series with said second and third impedance means for providing a source of collector current; and

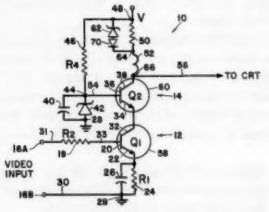
(f) the emitter and collector electrodes being further connected as input and output terminals, respectively.

4,250,463

OVERLOAD PROTECTION TO PREVENT SATURATION OF VIDEO AMPLIFIERS

Raymond F. Foster, Danbury, Wis., assignor to Telex Computer Products, Inc., Raleigh, N.C.

Filed Aug. 14, 1978, Ser. No. 933,436
Int. Cl.³ H03F 3/04
U.S. Cl. 330—298 **1 Claim**



1. A transistor power amplifier for video circuits, having tandem input stage and power output stage, having automatic means to prevent overload and saturation of said power stage, comprising:

(a) an input transistor amplifier having its emitter connected to ground through a parallel resistor and capacitor; its base connected to a source of video signals through an input resistor; and its collector connected to the emitter of said output power stage transistor;

(b) the base of said power stage transistor connected to a d.c. voltage source of selected magnitude through a series resistor, and to ground through a parallel capacitor and Zener diode, and its collector connected to a high voltage

d.c. source of selected magnitude, through a selected load impedance;

(c) said collector of said power stage transistor also connected to an output means; and

(d) Zener diode means connected directly across at least a part of said load impedance to limit the magnitude of d.c. voltage across said at least part of said load impedance to a selected magnitude.

4,250,464

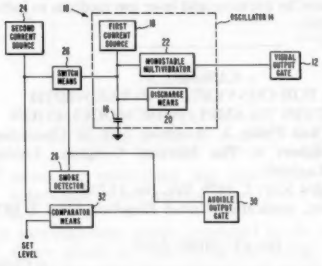
MULTI-MODE RELAXATION OSCILLATOR

Otto H. Schade, Jr., N. Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 3, 1978, Ser. No. 921,268

Int. Cl.³ G08B *19/00, 23/00;* H03K *3/02*

U.S. Cl. 331—65 **12 Claims**



1. In an oscillator circuit of the type wherein the charge rate of a capacitor from a current source determines the oscillation frequency, the improvement comprising:

an additional constant current source connected to said capacitor, said additional constant current source being of a magnitude to charge said capacitor at a predetermined rate;

switch means for controlling the flow of current to said capacitor from said additional constant current source, said switch means having an electrode at which a control signal is applied;

means for generating the control signal of said switch means upon the detection of a condition at which the oscillation frequency is to change, the signal from said generating means being connected to said control electrode of said switch means, the frequency of the oscillator being changed in accordance with the existence of the conditions being detected; and

wherein said additional constant current source includes a current mirror amplifier having master and slave paths, said master path being series connected to a resistor through said switch means and being rendered operative by said switch means to permit current flow in said master path, said resistor correlating the current flow in said master path with a voltage drop across said resistor, said slave path being connected to charge said capacitor and having current flow therein proportional to the voltage across said resistor.

4,250,465

RADIATION BEAM DEFLECTION SYSTEM

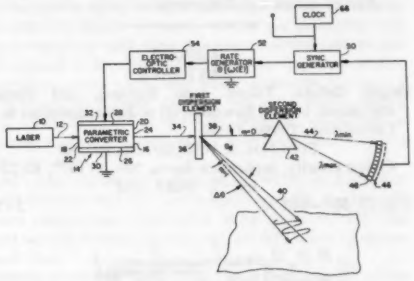
Kenneth G. Leib, Wantagh, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Aug. 29, 1978, Ser. No. 937,876

Int. Cl.³ H01S *3/101*

U.S. Cl. 331—94.5 D **19 Claims**

1. Apparatus for producing a controllably deviating scanning beam of radiation comprising: means for generating radiation of discrete wavelengths, control means for selecting specific wavelengths of said radiation on a cyclic, time-varying basis, primary radiant energy dispersion means in the path of radiation from said generating means, said primary dispersion means producing an output comprising at least zero and first order output beams, at least said first order output beam being deflected as a function of its wavelength such that a time-varying input of radiation of specific wavelengths into said dispersion means produces a scanning output beam therefrom that is deflected cyclically in accordance with the time and wavelength selected, secondary radiant energy dispersion means



positioned in the path of said zero order output beam from said primary dispersion means for angularly deflecting said zero order beam in accordance with its wavelength, an array of detectors sensitive to electromagnetic radiation and producing electrical output signals in response thereto positioned in the path of said deflected zero order beam to track its excursions whereby electrical signals that are indicative of the angular position thereof and of said scanning output beam are produced for use in feedback control functions.

4,250,466

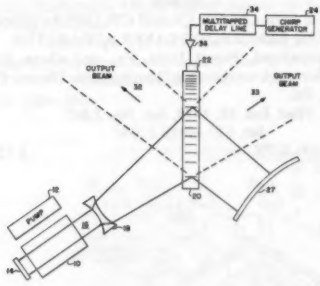
MULTIPLE PULSE LASER

James L. Jernigan, Inyokern, and Richard S. Hughes, Ridgecrest, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 23, 1978, Ser. No. 953,988

Int. Cl.³ H01S *3/10*

U.S. Cl. 331—94.5 M **8 Claims**



1. A multiple pulse laser comprising:

an active media for emitting coherent light along an optical path;

pumping means in proximity to said active media for stimulating said light emission;

a pair of mirrors, a first and a second, placed in said optical path, one on each side of said active media for reflecting said emitted light over said path, creating between said mirrors a resonant cavity;

optical diverging means placed between said active media and said first mirror for creating a predetermined pattern

of emitted light traveling from said active media toward said first mirror;

an acousto-optic cell placed in the path of said predetermined pattern of light for carrying acoustic pulses so that said acousto-optic cell will transmit and diffract said light pattern prior to reflection from said first mirror; and

means for generating multiple acoustic signals in said acousto-optic cell to have said pulses interact with said diverged light, so that said diverged light is transmitted and diffracted across said first mirror.

4,250,467

GAS LASER

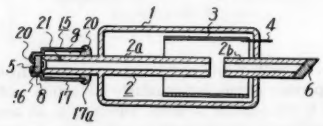
Shigeo Kubota, Tokyo; Asao Kurousu, and Shozaburo Hayakawa, both of Kawasaki, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 6, 1978, Ser. No. 957,747

Claims priority, application Japan, Nov. 9, 1977, 52/134292

Int. Cl.³ H01S *3/03*

U.S. Cl. 331—94.5 D **3 Claims**



1. In a discharge structure for a gas laser, a gas laser tube comprising an envelope, a plasma tube located in said envelope and having a portion thereof extending outside of said envelope, a mirror secured to the end of said tube perpendicular to the axis of said tube, a metal cap having a first cylindrical portion in which said mirror is nested, and a second cylindrical portion of greater diameter than said first cylindrical portion extending over the outer portion of said plasma tube but being of greater internal diameter than said tube leaving a gap between said second cylindrical portion and said plasma tube, means sealing said cap to said plasma tube to form a sealed gap therebetween, said tube having an aperture therethrough communicating said gap with the interior of said plasma tube.

4,250,468

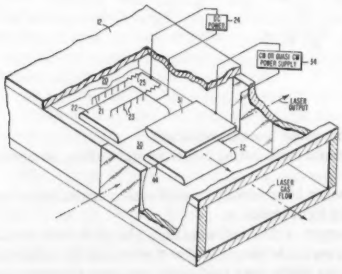
TECHNIQUE FOR CW OR QUASI CW OPERATION OF PLANAR ELECTRODE LASER APPARATUS

Richard L. Hundstad, Forest Hills, Pa., and Owen Farish, Bearsden, Scotland, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 16, 1979, Ser. No. 3,847

Int. Cl.³ H01S *3/097*

U.S. Cl. 331—94.5 PE **6 Claims**



1. A laser apparatus comprising:

a laser housing;

a flowing laser gas medium at a pressure in excess of 50 Torr;

spaced apart planar main laser electrodes defining a main laser discharge region therebetween;

quasi CW electrical excitation means connected to said planar main laser electrodes;

a glow discharge means located upstream from said main laser discharge region including spaced apart cathode and anode electrodes and a CW DC excitation means operatively connected to said spaced apart cathode and anode electrodes for producing a glow discharge current resulting in a continuous supply of electrons to said main laser discharge region via the flow of said laser gas medium; and

optical reflective elements defining a resonant optical cavity within said main laser discharge region, said quasi CW electrical excitation means establishing an electric field within said main laser discharge region and responding to said continuous supply of electrons from said glow discharge means by exciting said laser gas medium to induce lasing action.

4,250,469

FILTER FOR CONVERTING PULSE WIDTH MODULATION TO AMPLITUDE MODULATION

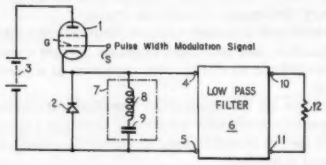
David Cooper, and Philip J. Davidson, both of Chelmsford, England, assignors to The Marconi Company, Limited, Chelmsford, England

Filed Mar. 2, 1979, Ser. No. 17,053

Claims priority, application United Kingdom, Mar. 2, 1978, 8223/78

Int. Cl.³ H03C *1/06*

U.S. Cl. 332—1 **6 Claims**



1. An amplitude modulation circuit including pulse width modulation switch means adapted to be connected to a d.c. power source and a switching control signal for producing a train of variable durations pulses of selected switching frequency and low pass filter means having a pair of input terminals connected with said switch means to receive said train of pulses for attenuating frequencies at the switching frequency of the switch means, a device connected in parallel with said pair of input terminals of the low pass filter and which device provides a current discharge path for the low pass filter while the switch is non-conductive, and a further filter also connected in parallel with the said pair of input terminals and which is arranged to provide substantial cancellation of the input susceptance of the low pass filter over at least part of its pass band.

4,250,470

SYLLABIC COMPANDER WITH LOGARITHMIC CHAIN

George G. Szarvas, Bethesda, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Jun. 28, 1978, Ser. No. 919,655

Int. Cl.³ H04B *1/64*

U.S. Cl. 333—14 **2 Claims**

1. A compander for use in the transmission of speech over a communication channel including a compressor in the transmitter and an expander in the receiver, each of said compressor and said expander implementing equations of the general form

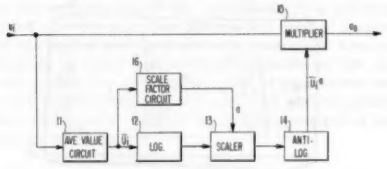
$$u_o = K u_i \bar{U}^a$$

where u_i is the input to the compressor or expander, u_o is the output of the compressor or expander, $\overline{U}$ is an average value of u_i or u_o averaged over the time of one syllable, K is a constant, and a is a scale factor which is a function of the compression or expansion rate, each of said compressor and said expander comprising:

an average value means for generating signals proportional to said average value $\overline{U}$,

a logarithmic chain connected to the output of said average value means and including logarithmic means for converting said signals proportional to said average value $\overline{U}$ to a signal proportional to the logarithm of said average value $\overline{U}$,

scaler means connected to the output of said logarithmic



means for multiplying said signal proportional to the logarithmic of said average value $\overline{U}$ by a said scale factor a,

an anti-logarithm means connected to the output of said scaler means for converting the output of said scaler means to a signal proportional to the anti-logarithm of the output thereof, said scale factor being adjustable to determine the compression or expansion rate of said compressor or expander, respectively,

a multiplier means connected to receive as inputs a signal proportional to u_i and the output of said logarithmic chain, said multiplier means producing an output proportional to u_o, and

in each of said compressor and said expander, means responsive to said signals proportional to said average value $\overline{U}$ for adjusting said scale factor as a function of $\overline{U}$.

4,250,471

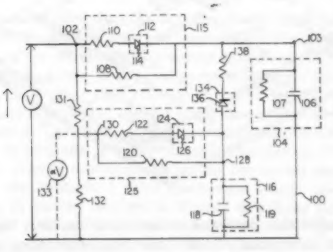
CIRCUIT DETECTOR AND COMPRESSION-EXPANSION NETWORKS UTILIZING SAME

Michael G. Duncan, 300 Walnut St., Clinton, Tenn. 37716

Filed May 1, 1978, Ser. No. 901,421

Int. Cl.³ H04B *1/64*

U.S. Cl. 333—14 **26 Claims**



1. A detector responsive to an input primary electrical source signal for controlling the conversion of an AC signal to a DC signal comprising:

first memory means for continuously receiving and storing input signals;

a first directional conducting circuit for providing said input signals to said first memory means, said first directional conducting circuit being connected between a primary input point for receiving said primary electrical source signal and said first memory means and comprising a first unidirectional conductor in electrical parallel arrangement with a first resistive element;

second memory means for continuously receiving and storing input signals, said second memory means including an output point for providing an output signal representative of the stored signal value of said second memory means;

a second directional conductor circuit for providing said input signals to said second memory means, said second directional conducting circuit for receiving a secondary electrical source signal and being connected between a secondary input point and said second memory means, and comprising a second unidirectional conductor in electrical parallel arrangement with a second resistive element; and

a third unidirectional conductor for providing an interaction path between said first and second memory means, said third unidirectional conductor being connected between said second memory means and said first memory means such that;

whenever the stored signal value of said first memory means is at least equal to the stored signal value of said second memory means, said third unidirectional conductor does not conduct and the stored signals values of said first and second memory means are substantially independent of each other and vary substantially only in response to changes in said input signals provided to said first and second memory means, respectively, as they discharge according to their respective time constants, and

whenever said primary electrical source signal is less than the stored value of said second memory means and said stored signal value of said first memory means decreases to a value substantially equal to the stored value of said second memory means, said third uniconductor conducts and the stored signal values of said first and second memory means vary in a similar manner and are substantially equal as they both discharge according to a combined time constant.

4,250,472

UNDESIRED SIGNAL CANCELLER

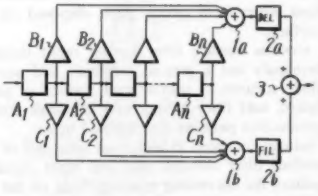
Yoshitaka Hashimoto, Chofu, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 21, 1978, Ser. No. 962,705

Claims priority, application Japan, Dec. 2, 1977, 52-145524

Int. Cl.³ H03H *15/00, 7/30*

U.S. Cl. 333—166 **8 Claims**



1. Apparatus for cancelling an accompanying undesired signal from a desired signal comprising:

(A) signal input means for receiving an input signal which includes desired and undesired signals;

(B) programmable filter means connected to said signal input means and responsive to said desired signal for forming a waveform corresponding to said undesired signal;

(C) a subtracting means connected between said signal input means and said programmable filter means for subtracting

an output of said programmable filter means from said input signal;

(D) control means connected to an output terminal of said subtracting means for detecting a level of said undesired signal to control said programmable filter means;

(E) signal output means connected to the output terminal of said subtracting means; and

(F) said programmable filter means including means for generating sequentially delayed replicas of corresponding differentiated components of said desired signal and means for superimposing said sequentially delayed replicas upon each other.

4,250,473

CIRCUIT BOARD HAVING PRINTED THEREON CONDUCTIVE PATTERNS TO BE CONNECTED WITH INPUT AND OUTPUT LEAD WIRES OF ACOUSTIC SURFACE WAVE FILTER ELEMENT

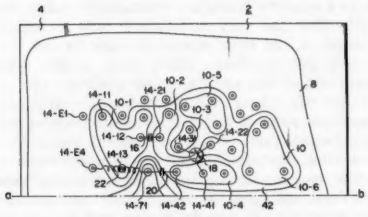
Tomoji Gemba, Kumagaya, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Mar. 14, 1978, Ser. No. 886,607

Claims priority, application Japan, Mar. 17, 1977, 52/31433[U]

Int. Cl.[2] H03H *9/04, 9/26, 9/32;* **H01L** *41/04*

U.S. Cl. 333—193 **16 Claims**



1. A circuit board assembly comprising:

an insulated circuit board having first and second surfaces;

a first input signal printed conductive pattern disposed on said first surface;

an earth printed conductive pattern disposed on said first surface;

a second output printed conductive pattern disposed on said first surface;

a third output conductive pattern disposed on said first surface;

said first, second, third and earth printed conductive patterns including a plurality of holes bored through said patterns and said insulating board for receiving electrical lead wires from circuit parts disposed on said second surface;

an acoustic surface filter having input terminals, output terminals and a ground terminal, said acoustic surface filter secured to said second surface of said insulating board, said filter having said terminals coupled to said conductive patterns through said holes;

an inductor coupled to said input terminals of said acoustic surface filter through said first input signal conductive pattern for correcting miss-matching on the input side of said acoustic surface filter caused by stray capacitance of said acoustic surface filter;

said earth conductive pattern coupled to said ground terminal of said acoustic surface filter for guiding in an eddy resonant current generated by the stray capacitance and said inductor;

said second and third output signal conductive patterns coupled to said output terminals of said acoustic surface filter;

a differential amplifier including a pair of input terminals coupled to said second and third output signal conductive patterns, respectively; and

means coupled to one input terminal of said acoustic surface filter for controlling a current path through which a resonance current flows to said earth conductive pattern region.

4,250,474

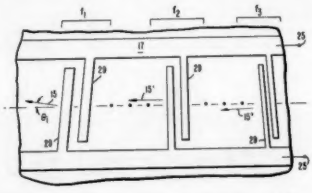
CONTINUOUS BEAM STEERING ACOUSTIC WAVE TRANSDUCER

Thomas R. Joseph, Yorba Linda, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Sep. 26, 1979, Ser. No. 78,861

Int. Cl.[3] H01L *41/04;* **G02F** *1/11*

U.S. Cl. 333—196 **7 Claims**



1. A continuous beam steering acoustic wave transducer, comprising:

a nonperiodic transducer structure responsive to acoustic energy coupled thereto, said structure having a centerline axis and including a plurality of interdigital electrodes with varying interelectrode spacings and angular relationships with respect to said centerline axis, said interelectrode spacings determining which of said electrodes actively relate to any particular frequency of said acoustic energy, and said angular relationships determining the propagation direction associated with said electrodes.

4,250,475

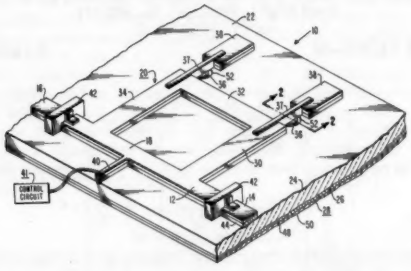
ADJUSTABLE PASSBAND FILTER

Alfred Schwarzmann, Mt. Laurel, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 1, 1979, Ser. No. 35,070

Int. Cl.[3] H01P *1/20, 3/08*

U.S. Cl. 333—205 **10 Claims**



1. An adjustable passband transmission line filter having a preselected substantially fixed center frequency comprising, in combination:

an input section of transmission line to which a signal to be filtered may be applied;

a second section of transmission line; and

a network coupled between said input and said second sections, said network comprising:

a third section of transmission line matched in impedance to

the input and second sections and coupling said input section to said second section;

a reentrant transmission line network in shunt with said third section of transmission line; said reentrant transmission line network comprising first, second and third transmission paths connected in series with one another in the order named, said first and said third transmission paths being connected at one end to spaced points along said third section, and at their other end to opposite ends of said second path, said first, second and third paths and said third section each having a length of substantially $n\lambda/4$ where n is an odd integer and λ is the wavelength of said center frequency; and

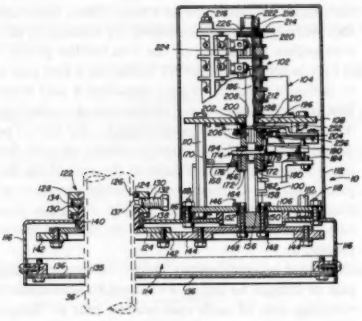
means including first and second controllable switching devices connected between said other end of said first and third paths, respectively, and a point of reference potential for switching said reentrant transmission line network between a first condition in which said reentrant transmission line network appears like an open circuit to said third section whereby said filter passes a first band of frequencies centered at said fixed center frequency and a second condition in which said reentrant transmission line network appears like a substantial value of capacitance load on said third section whereby said filter passes a second relatively narrower band of frequencies centered at said fixed center frequency.

4,250,476

AUXILIARY SWITCH FOR INDICATING THE CONDITION OF A CIRCUIT-INTERRUPTING DEVICE

David M. Evans, Palatine, and Richard J. Sabis, Chicago, both of Ill., assignors to S & C Electric Company, Chicago, Ill.

Filed Nov. 13, 1979, Ser. No. 93,668
Int. Cl.³ H01H 9/16
U.S. Cl. 335—17 **20 Claims**



1. Apparatus for indicating the condition of an interrupting device connectable to a high-voltage circuit, the interrupting contacts of the device being openable to prevent current flow therethrough; a first, stored-energy mechanism for biasing the contacts open whey they are closed, the first mechanism restoring contact-opening energy when the contacts are moved from open to closed; a second, shunt-trip mechanism which operates in response to either electrical conditions of the circuit or a remote command to release the stored energy for opening the contacts; a third mechanism which operates in response to manual movement thereof to release the stored energy for opening the contacts and which also operates in response to manual movement thereof to close the contacts following opening thereof by either the second or third mechanism; operation of the second or third mechanism not affecting the condition of the other mechanism; the indicating apparatus comprising:

means at ground potential for mimicing the putative condition of the contacts depending on the condition of the second and third mechanisms, for mimicing the movement of the third mechanism, and for thereby indicating the condition of the interrupting device, the mimicing means comprising

first means responsive to the lack of contact-opening operation of the second and third mechanisms for giving a first sensible indication that the contacts are putatively closed;

second means responsive to the contact-opening operation of either the second or third mechanism for giving a second sensible indication that the contacts are putatively open; and

third means responsive to contact-closing operation of the third mechanism for giving a third sensible indication that such operation is taking place.

6. Apparatus for indicating the condition of a high-voltage circuit interrupting device; the circuit interrupting device being of the type having: normally closed, movable interrupting contacts which are openable to interrupt circuit current flowing therethrough; a first, stored-energy mechanism for biasing the contacts open when they are closed, the first mechanism storing contact-opening energy when the contacts are moved from open to closed; a second, shunt-trip mechanism for releasing the stored energy to open the contacts in response to either electrical conditions of the circuit or a remote command; a third, manually operable mechanism movable out of a home position to a trip position in a first direction for releasing the stored energy to open the contacts, and further movable in the first direction to a reset position to close the contacts following opening thereof by either the second or third mechanism, movement of third mechanism in a second opposite direction back to its home position not moving the contacts; operation of the second or third mechanism not affecting the other mechanism; wherein the indicating apparatus comprises:

first means responsive to the contacts being closed and the third mechanism being either in its home position or between its home and trip positions for giving a first sensible indication thereof;

second means response to (a) the contacts being opened by the second or third mechanism and (b) the third mechanism being in either its home or its trip position for giving a second sensible indication thereof; and

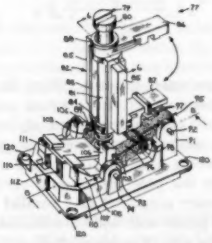
third means response to the third mechanism being either between its trip and reset positions or at its reset position for giving a third sensible indication thereof.

4,250,477

MECHANICAL LATCH APPARATUS

Frank J. Graninger, Milwaukee, and Robert J. Frey, Greendale, both of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Sep. 7, 1978, Ser. No. 938,649
Int. Cl.³ H01H 9/20; H01F 7/08
U.S. Cl. 335—169 **12 Claims**



1. In a mechanical latch device having an elongated operating plunger that is longitudinally movable between first and second positions to actuate and deactuate a set of contacts, the combination with said plunger of:

a latch that includes a pair of spaced arms each having a free end on which a respective latch tooth is formed;

a contact actuator having upper and lower spaced links mounted on said plunger, said actuator links extending radially from said plunger and being adapted to be coupled to said contacts for actuation and deactuation, said contact actuator also having a member depending from said lower actuator link and coupled to said latch for moving said latch with said plunger between its first, contact-actuating position and its second, contact-deactuating position;

a pair of spaced apart catches, each catch being disposed opposite the free end of a respective latch arm, each catch having a trigger portion extending away from its associated latch arm and each catch having a hooked end that is adapted to move along an arcuate path to and from a position where the hooked end restricts a respective latch tooth when said latch is moved to the contact-actuating position by said plunger;

a spanner extending across the space between said catches, said spanner having trip ends disposed in position to move the trigger portions of said catches to release said latch; and

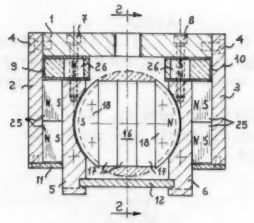
an electromagnet with an armature that is operable upon the energization of said electromagnet to move said spanner and catches to release said latch and plunger to allow their movement to the contact-deactuating position.

4,250,478

MANUALLY CONTROLLED MAGNETIC LIFTING DEVICE

Michele Cardone; Angelo Grandini, and Bruno Zaramella, all of Milan, Italy, assignors to Tecnomagnetica di Cardone, Grandini, Zaramella & C. S. a.s., Milan, Italy

Filed Oct. 29, 1979, Ser. No. 89,251
Claims priority, application Italy, Nov. 17, 1978, 23323/78[U]
Int. Cl.[3] H01F *7/20*
U.S. Cl. 335—288 **9 Claims**



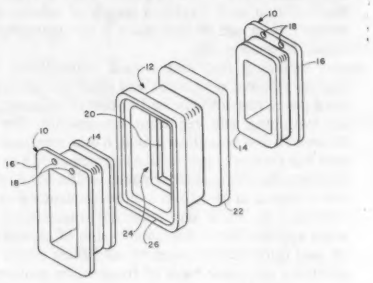
1. Manually controlled magnetic lifting device, comprising an external magnetic yoke forming a base, and two sidewalls; a first and a second pole piece respectively inside and parellel to the sidewalls, secured to the base of the yoke by means of insertion of spacers; a reversible permanent magnetic element inserted between the pole pieces, said reversible magnetic element being rotary supported on a parallel axis to the aformentioned pole pieces and with a polarization direction at right angles to the axis of rotation itself, and secondary magnetic elements inserted between each pole piece and the magnetic yoke, said secondary magnetic elements, for each pole piece, comprising a first set of permanent magnets with axis of magnetization at right angles to the surface of the pole pieces and, respectively, a second set of permanent magnets housed in the spacers, with axis of magnetization parallel and in line with the pole pieces themselves.

4,250,479

TRANSFORMER BOBBIN ASSEMBLY

James F. Bausch; Burkhard A. Brandt, and Craig A. Sanford, all of Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 9, 1979, Ser. No. 28,486
Int. Cl.[3] H01F *27/30*
U.S. Cl. 336—208 **1 Claim**



1. A transformer bobbin assembly for providing the necessary creepage and clearance distances and electrical insulation between each of the windings of a finished transformer, the bobbin assembly comprising:

a single first bobbin piece being a continuous single piece of selected electrically insulating material defining a first interior cavity along its central axis therethrough; and

a pair of second bobbin pieces each being a continuous single piece of a selected electrically insulating material each defining a second interior cavity along their central axis therethrough and dimensioned for nesting by direct insertion within the cavity of the first bobbin piece;

said first bobbin piece further including a first pair of flanges to define a channel to accommodate a coil winding, said first pair of flanges being dimensioned so that the surface distance from, and perpendicular to, the loci of points that define the end of the interior cavity of said first bobbin piece to the top of the flange at the end of the first bobbin piece plus the thickness of the flange provides at least the minimum creepage and clearance distances required between the coils to be wound on the first and second bobbin pieces;

each of said second bobbin pieces further including second pair of flanges to define a channel to accommodate a coil winding, one of each said second pair of flanges further defining at least two holes through the flange, said holes each having its axis parallel to the central axis of the second bobbin piece and dimensioned to allow the ends of said coil winding to pass through and to maintain at least the minimum creepage and clearance distances required;

the coil winding channel of said second bobbin pieces being substantially fully encircled by a portion of the coil winding channel of said first bobbin piece when each of said second bobbin pieces is nested within said first bobbin piece; and

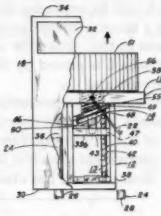
said first bobbin piece further having a web means located perpendicularly to its central axis within its interior cavity and having a substantially uniform height to define a hole therethrough that has substantially the same shape and at least the same size as the interior cavity through the second bobbin pieces, the height and thickness of the web means being selected so that twice its height plus its thickness provides at least the minimum creepage and clearance distances required between the coil windings to be wound on the second bobbin pieces.

4,250,480

APPARATUS AND METHOD OF MONITORING AUTOMATIC SAFETY CONTROL SWITCHES OF ELECTRICAL APPARATUS

Charles F. Newsom, 3731 Ole Miss Dr., Kenner, La. 70062, assignor to Charles Fred Newsom, Kenner, La.

Filed Jan. 25, 1979, Ser. No. 6,933
Int. Cl.[3] 340 *638, 652*
U.S. Cl. 337—6 **2 Claims**



2. Apparatus for monitoring the initial opening of an automatic safety switch connected in the power supply of electrical equipment comprising:

(a) a fixed heat softenable rod;

(b) a heating filament wound around said rod as a core and connected to an external lead by an end;

(c) a link pin, having a warning indicator, slidably mounted with respect to said rod and filament and connected to a second external lead by an end;

(d) frictional engaging means supported by said rod for the electrical connection of the free ends of said link pin and filament;

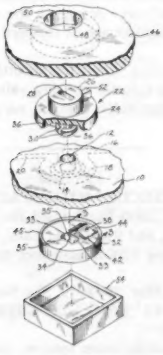
(e) spring means compressed by said electrical connection for oppositely bending said heat softened rod downward and breaking connection and biasing said link pin upward for displaying said warning indicator and breaking said connection.

4,250,481

VARIABLE RESISTANCE DEVICE FOR THICK FILM CIRCUITRY

Lance R. Kaufman, 131 White Oak Way, Mequon, Wis. 53092

Filed Nov. 21, 1978, Ser. No. 962,590
Int. Cl.[3] H01C *10/32*
U.S. Cl. 338—163 **2 Claims**



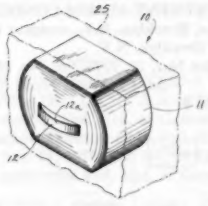
1. A variable resistance device for use in miniaturized thick film circuitry located on a continuous insulating substrate, comprising thick film circuit means (**16, 20**) on a first side of said substrate (**10**) connected in circuit with said miniaturized thick film circuitry and including first and second spaced conductive films (**14, 18**) having different electrical impedances located adjacent an opening (**12**) within said continuous insulating substrate (**10**), and impedance control means including a carrier having an opening removably connected to said substrate and including impedance varying means (**32, 38**) located adjacent said first side and providing circuit means (**38**) engaging said first and second films and movable with respect to at least one of said first and second film to vary the impedance in said thick film circuit, and a control member (**22**) journalled for movement within said opening and including a first portion (**30, 36**) formed to engage said impedance varying means and including a flexible projection extending through and beyond said carrier opening to present a part thereof that is exposed when said variable resistance device is assembled to permit removal of said impedance varying means and disassembly of said variable resistance device by manipulation, said part being selectively manipulatable between an expanded first position in which said first control member portion engages said carrier to maintain the engagement of said circuit means with said first and second films and a contracted second position in which said first control member portion disengages said carrier to remove said impedance varying means from said substrate, said control member including a second portion (**24, 26**) located adjacent a second side of said substrate to move said removably connected impedance varying means to vary the impedance in said thick film circuit in response to movement of said second portion.

4,250,482

PACKAGED ELECTRONIC COMPONENT AND METHOD OF PREPARING THE SAME

Allan V. Kouchich, Milwaukee; Lawrence D. Radosevich, Muskego; John C. Blanchard, Milwaukee, and Neal F. Thomas, Whitefish Bay, all of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Jan. 2, 1979, Ser. No. 537
Int. Cl.[3] H01C *1/034*
U.S. Cl. 338—275 **6 Claims**



1. A packaged electronic component includes an insulating body, an electronic chip disposed within the insulating body and having a pair of terminals, and two members of conductive sheet material which connect to opposite terminals, the two members extending laterally from said terminals to the outside of the insulating body and forming a pair of runner-like leads that terminate said laterally extending members.

4,250,483

SYSTEM FOR SIGNALIZED INTERSECTION CONTROL

Anthony C. Rubner, 6374 Iris Ct., Arvada, Colo. 80004

Continuation-in-part of Ser. No. 687,336, May 5, 1976, abandoned. This application Jan. 30, 1978, Ser. No. 873,697
Int. Cl.[3] G08G *1/07;* **G06F** *15/48*
U.S. Cl. 340—40 **16 Claims**

1. A traffic signal interconnect system in which a plurality of local controller means provide control of normal signal display cycles and include coordination means to provide signal cycle

program and maintain cycle time reference with other similar local controller means, said coordination means comprised of:

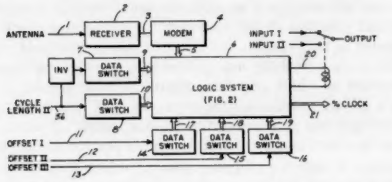
A. standard broadcast time receiving means,

B. internal time means to record and advance the time of year independently from said broadcast time receiving means,

C. broadcast time data check means to assure validity of data from said broadcast time receiving means,

D. time correction means to update data of said internal time means with data of said broadcast time receiver means after input of said broadcast time data check means,

E. programmable cycle means to input data for a plurality of cycle lengths,



F. a plurality of cycle input means to externally select a cycle length from data of said programmable cycle means,

G. cycle counter means to record and advance time of cycle independently from said internal time means with cycle duration based on data of said cycle input means,

H. cycle correction means to relate data of said cycle counter means to data of said internal time means,

I. programmable offset means to input data for a plurality of offsets,

J. a plurality of offset input means to externally select an offset from data of said programmable offset means and advance data of said cycle counter means by data of said programmable offset means.

4,250,484

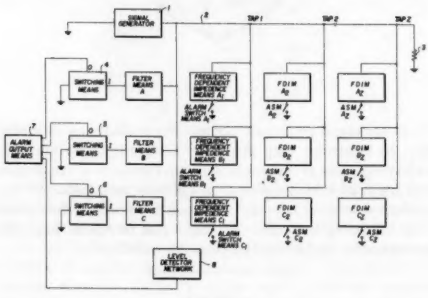
ALARM SYSTEM FOR DETECTING A PLURALITY OF DIFFERENT ALARM CONDITIONS

Harry G. Parke, Brooklyn, N.Y., assignor to Marine Electric Corporation, Brooklyn, N.Y.

Filed Nov. 21, 1977, Ser. No. 853,208

Int. Cl.³ G08B *19/00*

U.S. Cl. 340—52 F **15 Claims**



1. An electrical system for detecting a change in state of a switch means which is in one of a plurality of groups of switch means and for providing an indication of the group to which the switch means which has changed state belongs, each group of switch means including one or more switch means, comprising,

an electrical transmission line,

means for generating a signal on said transmission line having a plurality of frequency components at least equal in number to the number of said groups of switch means, each frequency component corresponding to one of said groups,

a plurality of filter means in circuit connection with said line, each filter means being associated with a different group and comprising a means for passing the frequency component corresponding to that group,

a plurality of frequency dependent variable impedance means at least equal in number to the number of said groups, each said means being associated with a group and comprising a means responsive to the change in state of a switch means in that group for attenuating the frequency component which is passed by the filter means associated with that group, and

means responsive to the attenuation of said frequency component beneath a predetermined level for providing an indication of the group corresponding to the attenuated frequency component which is the group which includes the switch means which has changed state.

4,250,485

MONITORING THE OPERATION OF A VEHICLE

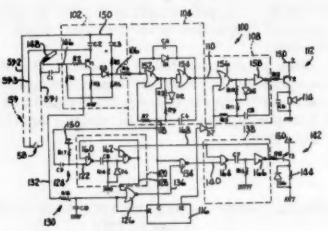
Jacob J. Mostert, Muldersdrift, and Henning M. Henderson, Johannesburg, both of South Africa, assignors to Kiloking (Proprietary) Limited, South Africa

Filed Aug. 17, 1978, Ser. No. 934,561

Claims priority, application South Africa, Aug. 17, 1977, 77/4986; Nov. 11, 1977, 77/6761; Feb. 21, 1978, 78/1022

Int. Cl.³ B60Q *5/00;* **G08B** *21/00*

U.S. Cl. 340—52 R **10 Claims**



1. A method of monitoring the operation of a motor vehicle, which method comprises:

sensing the vehicle's throttle opening;

sensing a parameter which corresponds to the magnitude of a variable load force acting on the vehicle in a direction opposite to the direction of forward travel of the vehicle; and

giving an indication when the throttle opening exceeds a predetermined throttle opening value, the predetermined throttle opening value being a varying function of said parameter.

4,250,486

VEHICLE MOTION ALARM

Edward H. Kiefer, 2400 Maplewood Dr.; George P. Lysenko, 1870 Hansel Dr., and Richard L. Cade, 190 S. Grandview, all of Dubuque, Iowa 52001, assignors to Deere & Company, Moline, Ill.

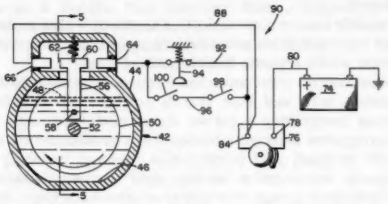
Filed Mar. 19, 1979, Ser. No. 21,371

Int. Cl.³ B60Q *5/00;* **G08B** *19/00*

U.S. Cl. 340—52 R **11 Claims**

1. A vehicle motion alarm system, comprising: an electrically energizable alarm; a source of electric current; an electrical circuit connecting the alarm for being energized by the source in accordance with preselected conditions of vehicle operation; said circuit including a first circuit loop containing a reverse motion switch means operable for completing a circuit through the alarm in response to reverse motion of the

vehicle; and said circuit including a second circuit loop containing a forward motion sensing switch means connected in series with engine and transmission condition sensing switch means with the forward motion sensing means and the engine and transmission condition sensing switch means acting to complete a circuit through the alarm only upon the engine being stopped while the vehicle moves forwardly or upon the transmission being in neutral while the vehicle moves forwardly; said forward and reverse responsive switch means including spaced forward and reverse switch contacts; an intermediate switch member located in a normal centered



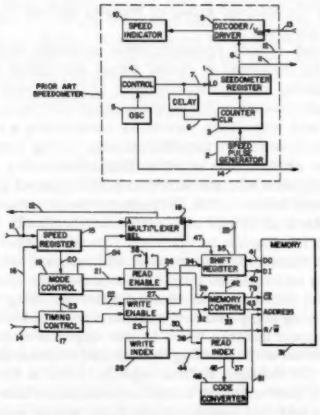
position between the contacts and mounted for movement in opposite directions to first and second positions respectively in engagement with the forward and reverse switch contacts to thereby complete a circuit through the forward and reverse switch means; a drive element adapted for connection to a vehicle drive for movement in forward and reverse directions respectively in response to forward and reverse movement of the vehicle; and connection means between the drive element and the intermediate switch member for causing the latter to be moved to its first and second positions respectively in response to forward and reverse movement of the drive member.

4,250,487

VEHICLE SPEED RECORDER

Robert D. Arnold, 1505 N. Quinn St., Apt. 17, Arlington, Va. 22209

Filed Oct. 27, 1978, Ser. No. 955,297
Int. Cl.³ G01P *1/10*; G06F *3/14*; G08B *21/00*
U.S. Cl. 340—62 **7 Claims**



1. A vehicle speed recorder, comprising:

(a) a speedometer that includes an electronic register containing digital speed data;

(b) a memory for storing in addressed locations a plurality of speed data samples from the speedometer register;

(c) mode control means, responsive to a signal from the speedometer register and having a write mode and a read mode, for controlling the transfer of data to and from said memory;

(d) first indexing means, made operable by a signal from said mode control means only in the write mode, for repeatedly generating the next member of a cyclic sequence of addresses that correspond to the addresses of said memory, whereby the last address so generated is retained until the next address is generated;

(e) writing means, initiated each time said first indexing means generates a new address, for transferring data from the speedometer register to the location in said memory whose address corresponds to that new address, whereby the data in any given location are retained there until new data are transferred to that location;

(f) a speed indicator for displaying speed data selected from said memory;

(g) second indexing means, connected to said memory and having first and second manual actuators that are made operable by a signal from said mode control means only in the read mode, for generating any selected member of the cyclic sequence of addresses, wherein in response to a signal from said writing means said second indexing means selects the address generated by said first indexing means each time a new address is so generated, wherein in response to the first manual actuator said second indexing means selects the next member of the cyclic sequence of addresses, and wherein in response to the second manual actuator said second indexing means selects the preceding member of the cyclic sequence of addresses, whereby at the onset of the read mode said second indexing means will contain the address last generated by said first indexing means and, as long as the read mode prevails, the address contained in said second indexing means may be stepped forward or backward by means of the first or second manual actuators respectively; and

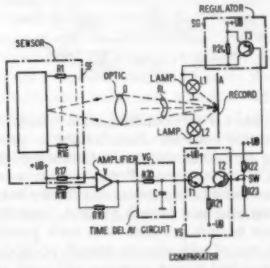
(h) reading means, made operable by a signal from said mode control means only in the read mode, for nondestructively transferring data to said speed indicator from the location in said memory whose address corresponds to the address currently selected by said second indexing means.

4,250,488

DEVICE FOR SCANNING PATTERNS WITH A REGULATED LIGHT SOURCE

Gerhard Haupt, Konstanz, Fed. Rep. of Germany, assignor to Computer Gesellschaft Konstanz mbH, Fed. Rep. of Germany

Filed Apr. 11, 1979, Ser. No. 29,017
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1978, 2816325
Int. Cl.³ G06K *9/40*
U.S. Cl. 340—146.3 AG **8 Claims**



1. A hand-held device to be manually guided over the surface of a recording medium for scanning patterns, comprising:

a light source of illuminating a scanning field on the recording medium;

a lens;

sensor means including a plurality of photoelectric sensors for receiving light reflected from the scanning field via said lens and converting the reflected light into analog electric image signals, means for summing the analog electric image signals into a summation signal, a plurality of first resistors respectively connected in circuit with said photoelectric sensors, and a second resistor connecting each of said plurality of resistors in common to a voltage source, the voltage drop occurring across said second resistor constituting the summation signal;

a time delay circuit connected to said sensor means for receiving and delaying the summation signal;

a comparator connected to said time delay circuit for comparing the delayed summation signal with a reference value;

a regulating circuit connected between said comparator and said light source for controlling the operation of the light source in accordance with the output of said comparator; and

an amplifier including a first input, a second input and an output, said first input connected to the junction of said first and second resistors, a third resistor connected between said second input and the voltage source, and a fourth resistor connected as a feedback element between said output and said second input.

4,250,489

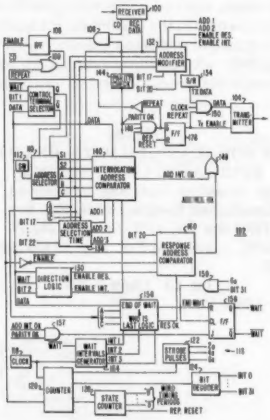
DISTRIBUTION NETWORK COMMUNICATION SYSTEM HAVING BRANCH CONNECTED REPEATERS

Allan A. Dudash; Waymon A. Melvin, Jr., both of Raleigh, N.C., and Leonard C. Vercellotti, Oakmont, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 31, 1978, Ser. No. 956,516

Int. Cl.[3] **H04Q** *9/00;* **H04M** *11/04*

U.S. Cl. 340—147 T **6 Claims**



1. A power line carrier communication system for an electric power distribution network characterized by power line conductors being defined in a pyramidal branch configuration so as to fan out in an outbound direction from a common base branch portion initially in a group of primary branch portions extending from said base branch portion, thereafter in groups of intermediate branch portions with each group thereof extending from one of said primary branch portions, and finally in groups of terminal branch portions with each group thereof extending from one of said intermediate branch portions, said communication system comprising:

plural bidirectionally addressable signal repeater means disposed in signal communication in an inbound direction with a single branch portion of one of said groups and in signal communication in an outbound direction with one of another of said groups of branch portions, the disposition of said plural repeater means defining different communication zones wherein each zone includes one or more common groups of said plural repeater means coupled to a common one of the primary, intermediate and terminal groups of branch portions, and each of said plural repeater means including first programmable logic means identifying a group of the repeater means within a separate communication zone and second programmable logic means producing a binary address identifying a separate one the repeater means within an associated group thereof;

addressable remote communication terminals within each of said communication zones each being in signal communication with a separate branch portion;

a central control communication terminal in signal communication with said base branch portion and including means transmitting a carrier signal modulated with an interrogation message intended for a predetermined remote terminal, said interrogation message including a repeater interrogation address data segment including therein serial groups of repeater address binary encoded data wherein each message address group designates a group of repeater means within a separate communication zone and wherein the repeater address encoded data of each message group designates a separate repeater means of an associated group;

each of said plural repeater means including means receiving and processing said interrogation message modulated carrier signal, means selectively responsive to one of the repeater address data groups in said interrogation address data message segment when corresponding to the communication zone and binary address identified by said first and said second programmable logic means therein, means authenticating the repeater address data of the selected group of the message address segment, means nullifying the repeater address data of the selected group of the message segment by removing the encoded data thereof, means responsive to the repeater interrogation address authenticating means for conditioning the repeater means in a response-wait mode status, and means further responsive to the repeater interrogation address authenticating means for retransmitting a carrier signal modulated by a modified form of the received interrogation message wherein the selected group of repeater address encoded data is removed;

each of said remote communication terminals including means for receiving a carrier signal modulated by an interrogation message having each of the groups of repeater address data nulled in said message address segment thereof and responding thereto by transmitting a carrier signal modulated by a response message having a repeater response address data segment thereof including plural serial data parts wherein each data part designates a group of repeater means within a separate communication zone and wherein all of said data parts have identically binary encoded information so that each remote terminal transmits the same repeater response address data when responding to a received interrogation message;

each of said plural repeater means further including means for receiving and processing a carrier signal modulated by said response message when in said response-wait mode status, means authenticating the repeater response address data of the message address segment when a data part thereof is corresponding to the communication zone identified by said first programmable logic means, means responsive to the last-named address data part for subsequently nullifying the encoded data of said last-named data part by removing the encoded data thereof, and means responsive to the repeater response address authenticating means for retransmitting a carrier signal modulated by a modified form of the received response message

wherein the repeater address encoded data of said last-named data part is removed; and

said central control communication terminal further including means for receiving a retransmitted modified response message modulating a carrier signal when the message response address segment thereof includes nulled data in the repeater address data parts.

4,250,490

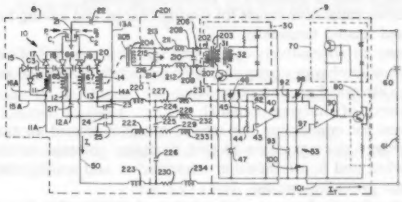
TWO WIRE TRANSMITTER FOR CONVERTING A VARYING SIGNAL FROM A REMOTE REACTANCE SENSOR TO A DC CURRENT SIGNAL

Charles J. Dahlke, New Germany, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.

Filed Jan. 19, 1979, Ser. No. 4,764

Int. Cl.[3] **G08C** *19/10;* **G06G** *7/20*

U.S. Cl. 340—870.37 **14 Claims**



1. An improved two wire current transmitter having a pair of terminals for connection through two wires to an external DC power supply means serially connected to an external load, said transmitter including a DC signal conditioning circuit having an oscillator and current control means for controlling current at said terminals, a remote sensor for measuring a change in parameter to be sensed mounted in position spaced substantially from said DC signal conditioning circuit and including means providing a direct current output signal, and means for coupling said sensor to said DC signal conditioning circuit to provide the direct current output to said DC signal conditioning circuit, wherein the improvement comprises a first transformer secondary located proximate to said DC signal conditioning circuit and coupled to the output of said oscillator, and a second transformer located proximate to said sensor and coupled to said first transformer secondary for providing excitation from said oscillator to said sensor, and said sensor further being coupled by elongated lines to said current control means for providing the direct current output to control the current at said terminals as a function of the change of said parameter.

4,250,491

WAITER SIGNAL DEVICE

Andy S. Dotson, P.O. Box 252, Pelzer, S.C. 29669

Filed Oct. 15, 1979, Ser. No. 84,919

Int. Cl.[3] **G08B** *5/00, 5/32;* **G09F** *11/00, 15/00*

U.S. Cl. 340—321 **5 Claims**

1. A table signal device for signalling a service attendant in a restaurant or lounge and the like comprising:

a base for supporting said device on a table;

an upstanding elongated pole carried by said base terminating at a free tip end;

a signal mechanism slidably carried by said pole for movement generally along the entire length thereof;

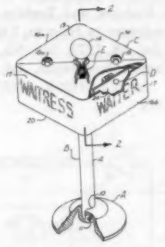
said signal mechanism being manually movable between a lowered non-signal position adjacent said base and a raised signal position adjacent said tip end of said pole;

said raised signal position presenting said signal mechanism as a signal for service;

illumination means carried by said signal mechanism;

power means for energizing said illumination means; and

switch means for activating said power means to energize said illumination means automatically in response to said signal mechanism reaching said raised signal position;



whereby said raised signal mechanism provides a visual service signal in a lighted room while said illumination means illuminates said signal mechanism to provide a visual service signal as required by darkness in a room.

4,250,492

NON-UNIFORM WEIGHTING CIRCUITRY

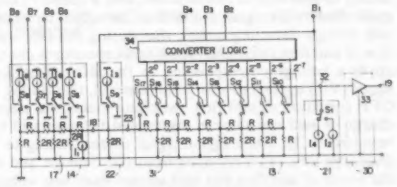
Kazuo Yamakido, Hachioji, and Nobuo Tsukamoto, Tachikawa, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 7, 1977, Ser. No. 840,178

Claims priority, application Japan, Oct. 12, 1976, 51-121276

Int. Cl.[3] **H03K** *13/02*

U.S. Cl. 340—347 DA **11 Claims**



1. A non-uniform weighting circuitry comprising:

a uniform weighting circuit means for converting step bit signals to an analog signal,

first means for supplying said analog signal with a positive or negative bias current in response to the polarity of a polarity bit signal, said first means providing an output signal,

a variable attenuator circuit means for attenuating the output signal of said first means in response to segment bit signals, said variable attenuator circuit means including a decoder means for decoding the segment bit signals, a plurality of bi-directional switch means controlled by the output signal of said decoder means, and a resistor network means connected to one end of respective one of said plurality of bi-directional switch means, said variable attenuator circuit means providing an output signal,

second means for supplying the output signal of said variable attenuator circuit means with a positive or negative bias current in response to the polarity of a polarity bit signal, and

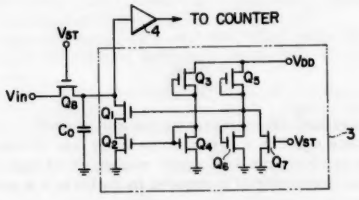
a first impedance conversion circuit means connected to an output terminal of said variable attenuator circuit means, said first impedance conversion circuit means having a low input impedance and providing an output signal, whereby spike-like noises generated by said bi-directional switch means are reduced.

4,250,493

ANALOG-TO-DIGITAL CONVERTER EMPLOYING CONSTANT-CURRENT CIRCUIT INCORPORATING MISFET

Toshimasa Kihara, Kodaira, and Toshiro Tsukada, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 18, 1978, Ser. No. 925,790
Claims priority, application Japan, Jul. 22, 1977, 52-87417
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 NT **3 Claims**



1. Signal processing equipment comprising:

a current circuit including a first and a second insulated gate type field effect transistor connected in series between a first circuit terminal and a reference potential, and

biasing means for applying a first and a second fixed bias voltages to the gates of the first and the second insulated gate type field effect transistor;

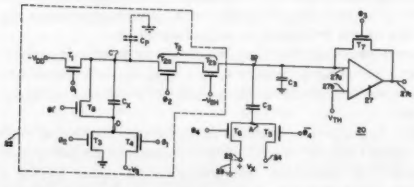
characterized in that a first switch means (**Q8**) is connected between an input terminal and said first circuit terminal, that a second switching means (Q7) is connected to said biasing means so as to control the operation of said current circuit, that a capacitor (Co) is interposed between said first circuit terminal and said reference potential, that an input terminal of a voltage detecting means (**134**) is connected to said first circuit terminal, that a counter (**135**) is controlled by the signal available at the output terminal of said voltage detecting means, that during the ON condition of said first switching means said capacitor is charged up to a voltage corresponding to the level of an input signal (Vin) applied to said input terminal, that during the OFF condition of said first switching means the electric charge of said capacitor is discharged through said current circuit (**1**), that a digital signal corresponding to the discharge time (T) is obtained from said counter, and that the levels of said first and said second fixed bias voltages (Vx, Vy) are so determined as to put said second insulated gate type field effect transistor into its saturated condition.

4,250,494

CHARGE TRANSFER ANALOG-TO-DIGITAL CONVERTER WITH PRECISE CHARGE CONTROL

Walter J. Butler, Scotia, and Charles W. Eichelberger, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 9, 1979, Ser. No. 56,070
Int. Cl.³ H03K *13/09*
U.S. Cl. 340—347 CC **16 Claims**



1. In an analog-to-digital converter of the type wherein an analog signal is converted to a digital signal by the transfer of a plurality of charge packets into and out of a two-terminal capacitive means for storaging charge, and having a comparator providing an output signal indicative of the voltage at the charge storing means reaching a predetermined threshold potential, the improvement comprising:

first means for connecting a first one of a pair of differential input potentials to be measured to a first terminal of said charge storing means prior to commencement of a measurement;

second means for connecting the remaining one of said pair of differential input potentials to be measured to said first terminal of said charge storage means at commencement of, and during, a measurement;

means coupled to a second terminal of said charge storing means for establishing a potential thereat, prior to commencement of a measurement, equal to said predetermined threshold potential;

charge packet generating means including means for providing a scaling potential of known magnitude;

another capacitive means for storing charge, and having first and second terminals;

means for alternatively connecting said first terminal of said another charge storing means to said scaling potential and to electrical ground potential;

a source of charging potential;

means for connecting the second terminal of said another charge storing means to said charging potential source when said first terminal is connected to said scaling voltage providing means;

means for discharging said another charge storing means during an initial portion, but less than all, of the time interval during which said another charge storing means is connected to said charging and scaling potentials; and

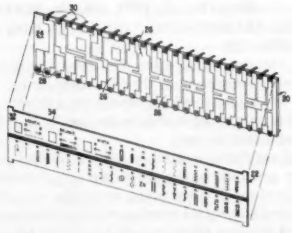
third means for connecting the second terminal of said another charge storing means to said charge storing means when the first terminal of said another charge storing means is connected to said electrical ground potential; said another charge storing means supplying a charge packet to said charge storing means of magnitude determined essentially only by the magnitude of said scaling potential and the ratio of the electrical capacitances of said another charge storing means to said charge storing means.

4,250,495

TOUCH SENSITIVE CONTROL PANEL AND A METHOD OF MANUFACTURE THEREOF

Howard L. Beckerman, Red Bank, and Allan M. Dob, Clifton, both of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Nov. 16, 1979, Ser. No. 95,115
Int. Cl.³ G08C *1/00;* **H01H** *9/26;* **B41J** *5/08;* **H02B** *1/04*
U.S. Cl. 340—365 C **13 Claims**



1. A control panel of the type having a plurality of touch sensitive areas in proximate relationship to corresponding functional indicia, said control panel comprising:

a non-conductive support member having a surface;

a plurality of regions of conductive material arranged on said support surface;

means for providing electrical connections to said plurality of conductive material regions;

an optically transparent graphic display member having a front surface and a rear surface, said rear surface having said functional indicia printed thereon in non-conductive material; and

adhesive means for adhesively securing said rear surface of said graphic display member to said support surface with said functional indicia in registration with said conductive material regions;

said graphic display member and said adhesive means forming a dielectric medium in contact with said conductive material regions so as to provide capacitive coupling between selective ones of said conductive material regions and a body portion of an operator touching said front surface of said graphic display member in an area having an overlying relationship to a selected one of said functional indicia visible through said graphic display member.

4,250,496

AUDIO CHIME-SIGNAL GENERATING CIRCUIT

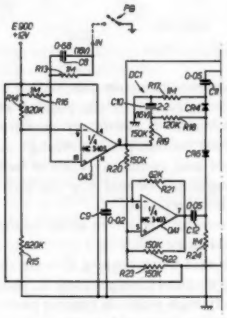
Roger E. Southgate, Yateley, England, assignor to Fieldtech Limited, England

Filed Apr. 20, 1979, Ser. No. 31,800

Claims priority, application United Kingdom, Apr. 24, 1978, 16132/78

Int. Cl.³ G08B *3/00*

U.S. Cl. 340—384 E **12 Claims**



1. An audio chime-signal generating circuit, comprising

(a) two oscillators having respective high and low operating frequencies;

(b) timing circuitry for switching on said oscillators for respective periods of time and for switching on the low-frequency oscillator after the high frequency oscillator;

(c) decay circuitry for causing progressive decay in the output of each oscillator over an end portion of the respective operating periods; and

(d) a sine shaping circuit through which the oscillator outputs are passed to remove harmonics of the high and low operating frequencies.

4,250,497

VIBRATION-RESISTANT COUPLING FOR INSULATED ELECTRICAL CONDUCTOR

Frigo Domenico, Olmo, Italy, assignor to F.I.A.M.M. S.p.A. Fabbrica Italiana Accumulatori Motocarri Montecchio, Montecchio Maggiore, Italy

Filed Dec. 1, 1978, Ser. No. 965,275

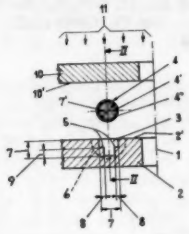
Claims priority, application Italy, Nov. 2, 1977, 41720 A/77

Int. Cl.² G08B *3/10*

U.S. Cl. 340—404 **10 Claims**

1. In combination, an electrical conductor of substantially circular cross-section having a conductive core provided with an insulating coating and a coupling forming an electrical extension of said conductor, said coupling comprising:

a connector plate of electrically conductive material provided with an open-ended groove on a face of said plate, said groove having a width adjacent said face and a depth transverse thereto both substantially equaling the diameter of said conductor and its coating, said conductor having a portion of limited length received in said groove, the latter being constricted at a level between its bottom and said face by an internal projection integral with said plate cutting into said coating and contacting said core; and



retaining means overlying said face for holding said portion of said conductor in said groove.

4,250,498

LIGHT BARRIER RECEIVER

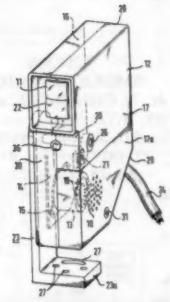
Arthur Walter, Waldkirch, Fed. Rep. of Germany, assignor to Erwin Sick GmbH, Optik-Elektronik, Waldkirch, Fed. Rep. of Germany

Filed May 11, 1979, Ser. No. 38,323

Claims priority, application Fed. Rep. of Germany, May 19, 1978, 7815175[U]

Int. Cl.³ G08B *13/18*

U.S. Cl. 340—556 **20 Claims**



1. A light barrier receiver having a shallow housing comprising at least base and cover parts, a receiving lens arranged to one narrow side of the housing and adapted to concentrate a received light beam on a photoelectric converter arranged behind the lens, at least one of the base and cover parts incuding cylindrical positioning pin means, the photoelectric converter being adapted to allow response of an alarm signaller following interruption of the light beam of the light barrier receiver via a processing circuit, said receiving lens, photoelectric converter and alarm signaller and the processing circuit being mounted on a circuit board, the circuit board having a hole of a diameter equal to said cylindrical positioning pin means and being located thereover and resilient means bearing on the circuit board to secure the circuit board in position by

rotationally biasing the circuit board about the positioning pin means against stop means.

4,250,499

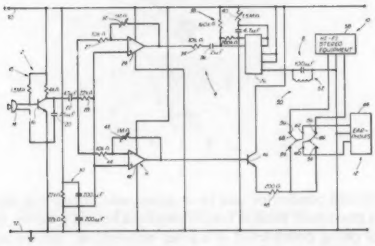
SOUND LEVEL DETECTOR WITH PROGRAM INTERRUPT

John A. Kienzle, 1802 N. Broadway, Shawnee, Okla. 74801

Filed Jun. 11, 1979, Ser. No. 47,014

Int. Cl.³ G08B *13/22*

U.S. Cl. 340—566 **15 Claims**



1. An apparatus for notifying a person of the presence of a detected sound, comprising:

means for detecting sound;

a source of a program;

output means;

switch means, associated with said sound detecting means, said program source, and said output means, for switching said output means between electrical connection with said detecting means and electrical connection with said program source; and

means, electrically connected to said sound detecting means and to said switch means, for controlling said switch means to electrically disconnect said output means from said program source and to electrically connect said output means to said sound detecting means when a sound having a magnitude in excess of a predetermined level is detected.

4,250,500

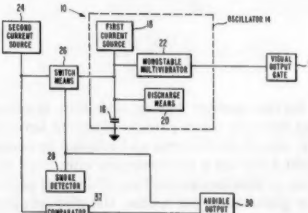
SMOKE DETECTOR

Otto H. Schade, Jr., N. Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 921,268, Jul. 3, 1978. This application Oct. 22, 1979, Ser. No. 87,447

Int. Cl.³ G08B *17/10*

U.S. Cl. 340—628 **5 Claims**



1. In a smoke detector of the type wherein an alarm signal is generated to activate an audible indicator, and wherein an oscillator circuit drives a pulsating visual indication of standby readiness with the frequency of the oscillator being derived from the charge rate of a capacitor, the improvement comprising:

a current source connected to the capacitor;

mode control switch means for interrupting flow from said current source to the capacitor, said switch means having a control electrode to which the alarm signal is applied, the frequency of the oscillator being increased during the alarm signal when said current flows through said switch means to increase the charge rate of the capacitor; and

duty cycle means for controlling the operative period of the audible indicator during each cycle of increased oscillator frequency.

4,250,501

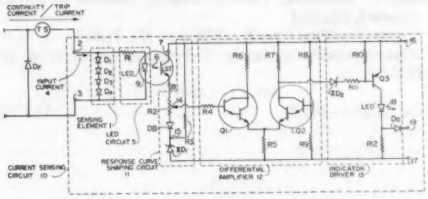
CURRENT SENSING CIRCUITRY

Kurt Pokrandt, 101-1406 Laburnum St., Vancouver, British Columbia, Canada (V6J 3W3)

Division of Ser. No. 753,368, Dec. 22, 1976, Pat. No. 4,121,122. This application Jul. 28, 1978, Ser. No. 929,002

Int. Cl.³ G08B *21/00*

U.S. Cl. 340—664 **22 Claims**



1. In combination with a trip solenoid of a circuit breaker which breaker is activated by the passing of a trip current through said solenoid, a continuity monitoring circuit for sensing a continuity current passing through said trip solenoid, the magnitude of said continuity current being substantially less than the magnitude of said trip current, said continuity monitoring circuit comprising:

(a) a current sensing element in series connection with said solenoid, said element having a current-to-voltage characteristic such that when current flowing through said current sensing element changes from a relatively low value to a relatively high value as current passing through said solenoid changes from said continuity current to said trip current, then a substantially less than proportional change in voltage occurs across said current sensing element;

(b) a light emitting diode circuit connected in parallel with said current sensing element for producing light energy dependent on the voltage across said current sensing element when current flows through said current sensing element;

(c) a light sensitive semiconductor device electrically isolated from said light emitting diode circuit and positioned to receive said light energy produced, said light sensitive semiconductor device being electrically responsive to said light energy produced.

4,250,502

RESOLUTION FOR A RASTER DISPLAY

Bernd Klauck, Buchenhain, and Michael Wolff, Benediktbeuern, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 13, 1979, Ser. No. 29,830

Claims priority, application Fed. Rep. of Germany, May 2, 1978, 2819286

Int. Cl.³ G06F *3/14*

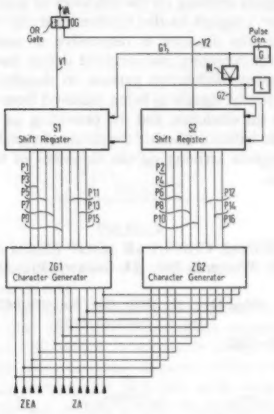
U.S. Cl. 340—728 **7 Claims**

1. A mixer circuit for use in producing a display matrix

having discrete points arranged to form a character on a raster screen in a video display device comprising:

a plurality of character generators for respectively producing identically dimensioned component matrix lines each containing a group of selectively positioned raster points, each group constituting a portion of a total coded output associated with a display matrix line of a character to be displayed in response to a coded input;

a plurality of shift registers each respectively connected to a character generator for producing a pulsed voltage output



corresponding to information received from respectively connected character generators;

a clock pulse generator and a load pulse generator connected to each shift register for control thereof such that all but one shift register pulsed voltage outputs are shifted by a fraction of a point width with respect to said one of said outputs; and

an OR gate connected to outputs of each shift register for combining said outputs into a signal representing a line of said matrix for display on said screen.

4,250,503

APPARATUS FOR DISPLAYING WAVEFORMS ON A MATRIX DISPLAY

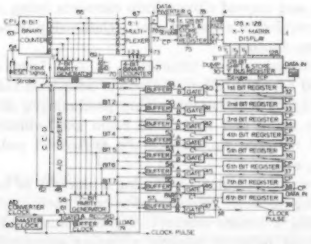
Ian A. Shanks, Malvern, England, assignor to National Research Development Corporation, London, England

Filed Jul. 21, 1978, Ser. No. 926,723

Claims priority, application United Kingdom, Jul. 26, 1977, 31397/77

Int. Cl.³ G06F *3/14*

U.S. Cl. 340—754 **21 Claims**



1. Apparatus for displaying waveforms comprising:

(i) an electro optic display having a layer of display material between two dielectric substrates, a first series of m strip electrodes on one substrate and a second series of n strip electrodes on the other substrate arranged to define an m×n plurality of elements across which an electric signal may be applied to change the layer from one state to another thereby causing an observable display effect;

(ii) means for generating m different reference waveforms from different L-bit, N′-ary numbers whereby each waveform has a different shape over a period t, L and N′ being integers greater than 1;

(iii) means for simultaneously applying a different one of said reference waveforms to each electrode in the first series of electrodes;

(iv) sampling means for providing a series of discrete amplitude values of the waveform signal to be displayed;

(v) means for selectively generating and storing ones of the m different reference waveforms, the generated waveforms representing the value of each amplitude sample relative to the order of the reference waveforms applied to the first set of electrodes, and for selectively applying such selectively generated waveforms concurrently to a plurality of the second series of electrodes;

(vi) whereby an alternating voltage with an rms value greater than a display effect threshold voltage is maintained across some non-selected elements of the display so that these elements are in a first state and a substantially zero rms voltage exists simultaneously across selected elements which are defined by one electrode of said first series of electrodes and by one electrode of said second series of electrodes to which the same waveforms are applied so that these elements are in their second state and collectively display the waveform signal.

4,250,504

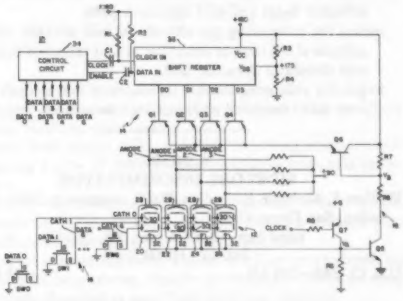
GAS DISCHARGE DISPLAY CIRCUIT

Charles W. Eichelberger, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 23, 1979, Ser. No. 68,752

Int. Cl.³ G08B *5/36*

U.S. Cl. 340—758 **31 Claims**



1. A gas discharge display, comprising:

a gas discharge tube including an anode, a plurality of display cathodes and a control cathode;

means for applying a voltage of sufficient magnitude to said anode to cause said tube to fire to cause a control current to flow through said control cathode, said control current being representative of the magnitude of the current flowing through lighted ones of said display cathodes;

means for determining which ones of said display cathodes are to be lighted when said gas discharge tube is fired; and

current regulation means responsive to the current flow through said control cathode for adjusting the magnitude of the voltage applied to said anode to a level causing said control current to reach a predetermined value at which the current through, and therefore the luminosity of, said

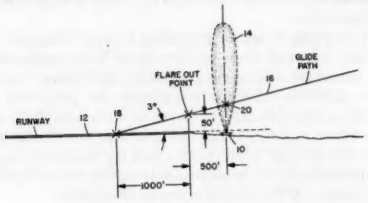
lighted display cathodes is also adjusted to a predetermined level.

4,250,505

INDEPENDENT LANDING MONITOR

Ernest O. Kirner, Coral Springs, Fla., assignor to The Bendix Corporation, Southfield, Mich.

Filed Dec. 7, 1979, Ser. No. 101,309
Int. Cl.³ G01S *13/00*
U.S. Cl. 343—5 LS **4 Claims**



1. An aircraft landing guidance system monitor for indicating the location of the aircraft within a tolerable distance from a predetermined point on the approach path established at predetermined glide slope and azimuth angles by the guidance system, comprising,

a radio altimeter aboard the aircraft including a transmitter and receiver and providing a downwardly directed radio beam for continuously measuring the altitude of the aircraft;

a beam forming reflector positioned on the ground so that the beam formed by reflection of said radio altimeter beam intersects the approach path established by said guidance system at a known altitude;

a threshold detector to which output from said radio altimeter receiver is applied and providing an output only when the amplitude of said receiver output applied thereto corresponds to the amplitude levels within said reflector beam at a tolerable distance from said intersection of said reflector beam and said approach path;

means for comparing the altitude of said aircraft with said altitude at the time of detection of said reflected energy by said threshold detector; and

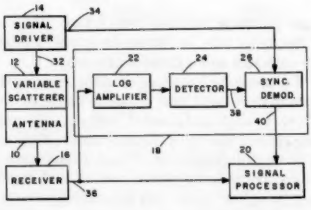
means for indicating the safe operation of said aircraft whenever said compared altitudes are substantially equal.

4,250,506

SIDELOBE DISCRIMINATOR

William F. McNaul, Escondido, Calif., assignor to Cubic Corporation, San Diego, Calif.

Filed Sep. 12, 1979, Ser. No. 75,143
Int. Cl.³ H04B *7/00*
U.S. Cl. 343—100 CS **25 Claims**



1. A system for discriminating between signals arriving on the mainbeam of a collecting antenna and signals arriving on the sidelobes of the antenna, comprising

a variable scatterer coupled to a collecting antenna for variably scattering said sidelobes of said antenna;

a signal driver for providing a modulation signal having a predetermined modulation pattern, wherein the signal driver is coupled to the variable scatterer for variably scattering said sidelobes in response to said modulation signal to thereby cause signals arriving on said sidelobes to have said predetermined modulation pattern;

a receiver coupled to said antenna for providing received signals in response to signals arriving on the mainbeam and signals arriving on the sidelobes of said antenna; and

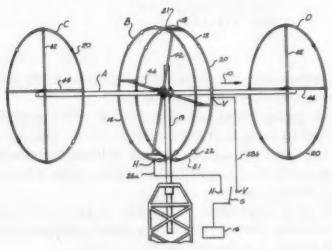
a detector coupled to the receiver and the signal driver, wherein the detector is responsive to said modulation signal for detecting said received signals having said predetermined modulation pattern, to thereby discriminate said detected signals as being received from signals arriving on sid sidelobes, and for providing an identification signal to indicate whether the received signal is coincident with signals arriving on the sidelobes of the collecting antenna.

4,250,507

DIRECTIONAL CIRCULAR LOOP BEAM ANTENNA

Jefferson C. Wingard, Rte. #1 Country Pl., Anderson, S.C. 29621

Filed Dec. 28, 1978, Ser. No. 974,063
Int. Cl.³ H01Q *7/00*
U.S. Cl. 343—742 **5 Claims**



1. A directional antenna array comprising:

a horizontal beam axis;

a pair of individually driven circular loop elements carried vertically about said beam axis non-electrically coupled to one another;

a circular reflector loop element carried vertically about said beam axis adjacent said pair of driven loop elements;

a first of said driven loop elements being adapted for vertical polarization;

a second of driven loop elements being adapted for horizontal polarization; and

said first and second driven loop elements being mechanically coupled in a spaced apart relationship closely adjacent one another;

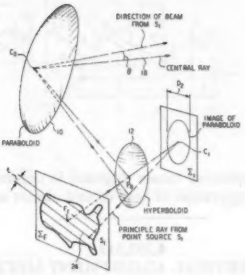
input terminal means connected to said loop elements adapted for connection to a power source so that operation may be had for selectively producing a directional pattern along said horizontal beam axis which may be shifted between the vertical or horizontal polarization modes; and

said driven loop elements including a plurality of individual radiating sections joined end-to-end, each said section including a center conductive core encapsulated by a reinforced dielectric material affording structural rigidity enabling said sections to bend for assembly and disassembly, said dielectric material reducing mutual coupling between said driven loops enabling closer juxtaposed positioning in said antenna array.

4,250,508
SCANNING BEAM ANTENNA ARRANGEMENT

Corrado Dragone, Little Silver, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 26, 1979, Ser. No. 33,734
Int. Cl.[2] H01Q 19/12
U.S. Cl. 343—779 8 Claims



1. A feed arrangement for use with an antenna system characterized in that

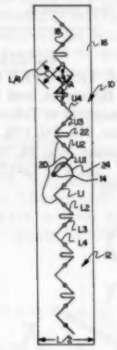
the feed arrangement comprises a linear phased array of feed elements (14) capable of effecting an essentially planar wavefront (25) which is scannable along one angular coordinate, the array being disposed within a rectangular waveguide section (27) with the wide sides (26_1, 26_2) thereof oriented parallel to both the linear array and said one angular coordinate, the rectangular waveguide section comprising an offset curved focusing reflecting surface (28) disposed therein for bidirectionally converting an essentially planar wavefront propagating between the linear array and the reflecting surface into a converging wavefront which is focused to a point source at a focal plane (Σ_f) of the feed arrangement and when the array is scanned along said one angular coordinate the resulting point sources of a scanning wavefront move along a straight line of the focal plane, and the principle ray of each converging wavefront is always directed at a predetermined remote point beyond the focal plane regardless of the direction of scan along said one angular coordinate.

4,250,509
CIRCULARLY POLARIZED ZIGZAG ANTENNA

Gerald W. Collins, Quincy, Ill., assignor to Harris Corporation, Melbourne, Fla.

Filed Aug. 29, 1979, Ser. No. 70,685
Int. Cl.[3] H01Q 1/36
U.S. Cl. 343—806 10 Claims

1. A rotating polarization zigzag antenna comprising at least one conductive zigzag element comprised of plural segments, each L/4 in length were L is the means operating wavelength of the antenna, disposed end to end in a zigzag configuration, each directly joined at one end to the adjacent end of an adjacent segment and indirectly joined at the other end to the adjacent end of the other adjacent segment through a substantially nonradiating L/2 length delay line, whereby each said segment is skewed in space and orthogonal in phase to an

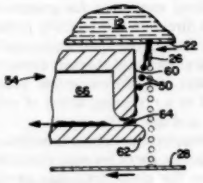


adjacent segment, said antenna thereby being adapted to radiate or receive rotating polarization electromagnetic energy.

4,250,510
FLUID JET DEVICE

John L. Dressler, Spring Valley, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Sep. 4, 1979, Ser. No. 71,917
Int. Cl.[3] G01D 15/18
U.S. Cl. 346—75 7 Claims



1. A fluid jet device for depositing drops of fluid on a fluid receiving medium, comprising:

coating head means defining a fluid receiving reservoir and having a row of orifices communicating with said reservoir,

means for supplying an electrically conductive fluid to said reservoir under pressure, said fluid flowing through said orifices to produce a row of fluid filaments,

means for stimulating each of said fluid filaments to break up into a jet drop stream, thereby producing a row of jet drop streams directed at said fluid receiving medium,

means for maintaining said fluid in said reservoir at a predetermined electrical potential,

electrically conductive catcher means, defining a continuous electrically conductive drop charging and catching surface extending along the length of and substantially parallel to said row of jet drop streams, for electrically charging the drops formed from each of said filaments when a charge potential, differing from said predetermined electrical potential, is applied to said catcher means and for attracting the drops so charged toward said surface when said charge potential is applied to said catcher means, such that the charged drops are caught on said surface and are prevented from striking said fluid receiving medium, while uncharged drops are permitted to travel past said catcher means for deposit on said fluid receiving medium, and

means for applying said charge potential or said predetermined potential to said catcher means such that said charge potential or said predetermined potential is impressed upon said surface.

4,250,511

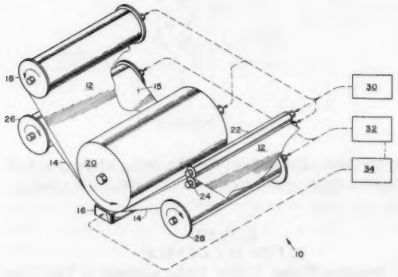
THERMAL TRANSFER COLOR PRINTER

William W. Stein, Beaverton, and Robert W. Burns, Newberg, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 910,170, May 30, 1978, abandoned. This application Aug. 16, 1979, Ser. No. 67,486

Int. Cl.³ G01D *15/10*

U.S. Cl. 346—76 PH **10 Claims**



1. Thermal transfer printing apparatus, comprising

a stationary printhead having a plurality of individually energizable thermal elements arranged in a row,

a carrier sheet supported for movement across said printhead in a direction substantially perpendicular to said row with one face of the sheet being maintained in heat transfer relation with said thermal elements, said sheet bearing a plurality of different color record-forming mateials arranged in a repeating series of stripes extending transverse to said direction,

means for supporting a record medium on the opposite face of said carrier sheet for movement in said direction,

drive means for propelling said carrier sheet and record medium across the printhead at different rates, with the rate of movement of the carrier sheet exceeding that of the record medium,

means for energizing selected thermal elements in timed relation to the movement of said carrier sheet to transfer spots of color record-forming materials from said sheet to the record medium.

4,250,512

HEATING DEVICE FOR RECORDING HEADS IN INK MOSAIC RECORDERS

Erich Kattner; Guetner Rosenstock, and Hans Kern, all of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

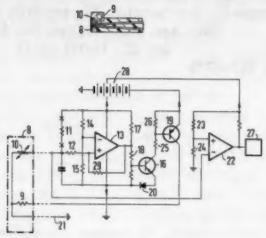
Continuation of Ser. No. 865,178, Dec. 28, 1977. This application Sep. 14, 1979, Ser. No. 75,422

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1976, 2659398

Int. Cl.³ G01D *15/16*

U.S. Cl. 346—140 R **9 Claims**

1. In a heating device for the recording fluid in the recording head of a mosaic recorder containing a plurality of ink ducts terminating in outlet orifices, the combination of said orifices being disposed closely adjacent one another, a heating device disposed to concentrate the heating action closely adjacent said orifices, whereby heat is applied to ink thereat as it is about to be discharged therefrom, a circuit arrangement operatively connected to said heating device for controlling the heating action thereof upon such ink, a further circuit arrangement for preventing the operation of the recording head until the nominal operating temperature thereof has been achieved, and a



temperature responsive sensor disposed in common with, and controlling the operation of both of said circuit arrangements.

4,250,513

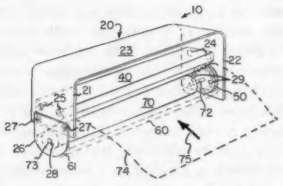
LINEAR VERTICAL ADJUSTMENT MECHANISM

James L. Harlow, Mt. Solon, and Ward L. Karns, Waynesboro, both of Va., assignors to General Electric Company, Waynesboro, Va.

Filed Sep. 19, 1979, Ser. No. 77,001

Int. Cl.³ G01D *15/06*

U.S. Cl. 346—153.1 **11 Claims**



1. A linear adjustment mechanism for use in a recording assembly to axially align a magnetic brush rotatable about a shaft with respect to the surface of a recording medium, comprising:

a bracket to support the axes of said brush with respect to the surface of said recording medium,

a plurality of mounting pins projecting from said bracket, and

a rotatable apertured disc disposed on said mounting pins and adapted to support one end of said shaft of said brush at a plurality of selectively incremental distances along only one axis with respect to said mounting pins upon rotation.

4,250,514

CAPACITANCE DIODE WITH PARTICULAR DOPING PROFILE

Gerhard Raabe, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

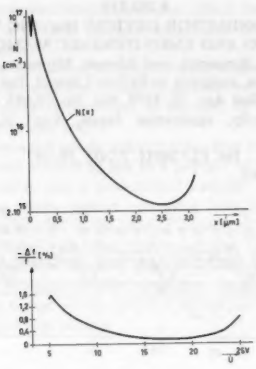
Filed Jul. 23, 1979, Ser. No. 59,828

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1978, 2833318

Int. Cl.³ H01L *29/92*

U.S. Cl. 357—14 **1 Claim**

1. A capacitance diode having a semiconductor body with an epitaxial layer of a first conductivity type provided on a substrate, in which a doping profile is formed in the epitaxial layer by controlled doping during the epitaxial layer growth, and a surface zone of the second conductivity type in the epitaxial layer which forms a p-n junction with said layer, characterized in that the doping profile varies according to the equation



$$N(x) = k \cdot \frac{\left[\ln \frac{x}{x_0}\right]^n}{x^\beta}$$

between the limits N_o and N_E, in which equation the ratio of N_o to N_E is adapted to the desired capacitance swing,

x is the distance in μm from the p-n junction,

x_o is the width of the barrier layer in μm at the p-n junction at the voltage $-U_D$, where U_D is the diffusion voltage of the p-n junction in volts,

N_o is the doping concentration at the p-n junction in at.cm^{-3},

N_E is the starting doping concentration of the epitaxial layer in at.cm^{-3},

k is a constant value between 5.10^{14} and 1.10^{17},

n is a constant integer between 0 and 6, and

β has a constant value between 1 and 2.

4,250,515

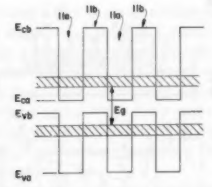
HETEROJUNCTION SUPERLATTICE WITH POTENTIAL WELL DEPTH GREATER THAN HALF THE BANDGAP

Leo Esaki, Chappaqua; Raphael Tsu, Mt. Kisco; George A. Sai-Halasz, and Leroy L. Chang, both of Lake Mohegan, all of N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 9, 1978, Ser. No. 914,098

Int. Cl.[3] **H01L** *29/205, 47/00*

U.S. Cl. 357—16 **6 Claims**



1. A semiconductor superlattice structure comprising: first and second different semiconductor materials forming a plurality of alternate layers, each interfaced to its adjacent layer in a semiconductor heterojunction; each said layer having a thickness of from 30 to 60 angstroms; the bottom of the conduction bands of said first and second materials being at different energy levels and the tops of said valence bands of said first and second materials being at different energy levels; the bottoms of said conduction bands of said first and second materials forming a plurality of serially arranged potential wells and barriers; said potential wells and barriers caused by differences in the band structures of said different materials forming said alternate layers and the interfacing of said layers in said heterojunctions; and the distance between the bottoms of said potential wells in said conduction band and the tops of said potential wells in said valence band being less than the depth of said potential wells.

4,250,516

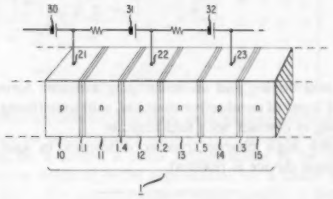
MULTISTAGE AVALANCHE PHOTODETECTOR

John M. Worlock, Fair Haven, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 6, 1979, Ser. No. 64,040

Int. Cl.[3] **H01L** *29/16*

U.S. Cl. 357—16 **22 Claims**



1. A reduced noise avalanche photodetector comprising:

a plurality of abutting layers of semiconductor material of alternating opposed conductivity type, said layers being grouped into a sequence of pairs of layers from a first end to a second end of said photodetector;

characterized in that:

the bandgap of the material comprising the second layer of each pair is larger than the bandgap of the material comprising first layer of the pair of layers adjacent to said second layer;

the bandgap of the first layer of at least one pair of said sequence is at least as large as the bandgap of the first layer of another pair of said sequence, which another pair is closer to said first end; and

said reduced noise avalanche photodetector further includes electrode means formed on the first layer of each pair of said sequence of pairs of layers and on the second layer of the last pair of said sequence for reverse biasing the heterojunctions formed at the interface between the first layer and the second layer of each pair of said sequence and for forward biasing the heterojunctions formed at the interface between the layers from different pairs of said sequence.

4,250,517

CHARGE TRANSFER, TETRODE BUCKET-BRIGADE DEVICE

Hsin-fu Tseng, Cupertino, Calif., assignor to Reticon Corporation, Sunnyvale, Calif.

Filed Nov. 30, 1979, Ser. No. 98,783

Int. Cl.[3] **H01L** *29/78, 29/04;* **G11C** *19/28*

U.S. Cl. 357—24 **8 Claims**

1. An MOS bucket-brigade, charge transfer, device fabricated on a semiconductor substrate comprising a channel of propagation, and a plurality of stages each of which includes:

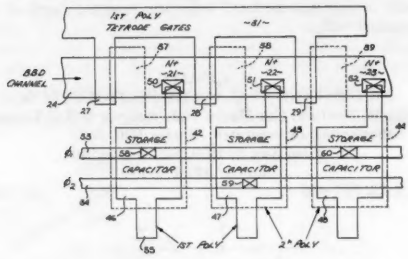
a first gate having first and second opposite sides;

a second gate having first and second opposite sides, said first side of said second gate overlapping said second side of said first gate;

a doped region in said substrate spaced-apart from said second side of said first gate and extending between said second side of said second gate and said first side of said first gate of the next succeeding one of said stages; and

said first gate being formed from a layer of conductive material;

a capacitor disposed between said region and said second gate, said capacitor comprising an extension of said second gate disposed apart from the channel of propagation



in said device and an underlying member formed from said layer of conductive material, said underlying member being in contact with said regions;

whereby high charge transfer efficiency in said bucket-brigade device is realized.

4,250,518

MAGNETIC FIELD SENSOR SEMICONDUCTOR DEVICES

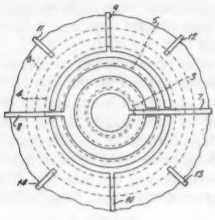
Greville G. Bloodworth, and Martin H. Manley, both of Southampton, England, assignors to The General Electric Company Limited, London, England

Filed Aug. 29, 1978, Ser. No. 937,845

Claims priority, application United Kingdom, Sep. 8, 1977, 37555/77

Int. Cl.³ H01L *27/22, 29/82, 29/96*

U.S. Cl. 357—27 **6 Claims**



1. A semiconductor device capable of magnetic field sensing comprising a semiconductor body having a substantially planar surface and incorporating first, second, third and fourth regions which are alternately of opposite conductivity types in the order stated and which all extend to said surface, the first region being contiguous only with the second region, the fourth region being contiguous only with the third region, the second and third regions being contiguous with each other, the first and second regions being of annular forms having a common axis perpendicular to said surface and the fourth region being in the form of a solid of revolution which is coaxial with and centrally disposed with respect to the first and second regions so as to be encircled by the first and second regions, and an electrode system providing separate connections for said four regions, the electrode contact for the second region being made only at points which are more remote than the first region from said axis, and the electrode contact for at least one of the second and third regions being non-uniform around said axis.

4,250,519

SEMICONDUCTOR DEVICES HAVING VMOS TRANSISTORS AND VMOS DYNAMIC MEMORY CELLS

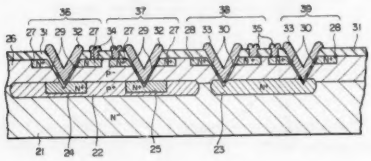
Junichi Mogi, Kawasaki, and Kiyoshi Miyasaka, Yokohama, both of Japan, assignors to Fujitsu Limited, Tokyo, Japan

Filed Aug. 31, 1979, Ser. No. 71,083

Claims priority, application Japan, Aug. 31, 1978, 53-119700[U]

Int. Cl.³ H01L *27/02, 29/06*

U.S. Cl. 357—41 **8 Claims**



1. A semiconductor device which has V-groove metal oxide semiconductor (VMOS) transistors and VMOS dynamic memory cells, comprising:

a lightly doped semiconductor single-crystalline substrate of a first conductivity type;

a semiconductor epitaxial layer of the opposite conductivity type formed selectively on said substrate, said epitaxial layer having V-grooves for the VMOS transistors and the VMOS dynamic memory cells and having heavily doped regions of the first conductivity type adjacent said V-grooves at the surface portions of said epitaxial layer;

an oxide layer formed on said V-grooves and epitaxial layer;

electrode layers formed on said oxide layer in said V-grooves;

a first heavily doped region of the first conductivity type formed in a first surface portion of said substrate, the bottom peaks of said V-grooves of said VMOS transistors reaching to said first heavily doped region; and

second heavily doped regions of the first conductivity type formed in a third heavily doped region of the opposite conductivity type, said third heavily doped region being formed in a second surface portion of said substrate, each bottom peak of said V-grooves of said VMOS dynamic memory cells reaching to a separate one of said second heavily doped regions

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4,250,520

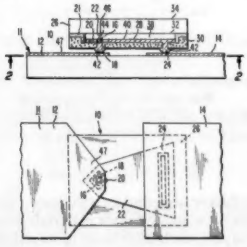
FLIP CHIP MOUNTED DIODE

Edgar J. Denlinger, East Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 14, 1979, Ser. No. 20,333

Int. Cl.³ H01L *23/48, 29/44, 29/52*

U.S. Cl. 357—68 **9 Claims**



1. A thin film circuit, comprising:

(a) a circuit carrier which includes thereon a conductor film pattern having a first portion spaced from a second portion;

(b) a planar semiconductor diode which overlaps and is bonded to the first and second portions of the conductor film pattern;

(c) the semiconductor diode comprising a generally triangular cathode region surrounding an anode region, the anode region being in proximity to an apex of the triangular cathode region; and

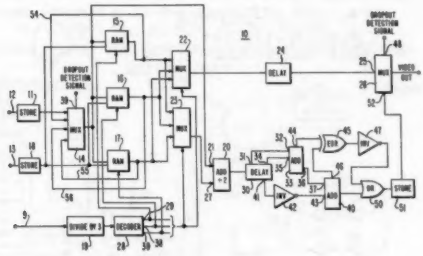
(d) a post-shaped anode contact extending from the anode region and bonded to the first portion of the conductor film pattern, and a post-shaped cathode contact, distal from the anode contact, extending from the cathode region and bonded to the second portion of the conductor film pattern; with that portion of the cathode region which overlaps the first portion of the conductor film pattern being of smaller area than that portion of the cathode region which overlaps the second portion of the conductor film pattern.

4,250,521

VIDEO SIGNAL DROPOUT COMPENSATOR

David I. Wright, Riverton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 19, 1979, Ser. No. 59,112
Int. Cl.³ H04N *5/76, 5/78, 5/93*
U.S. Cl. 358—8 **8 Claims**



1. A video signal dropout compensator for forming a replacement signal for a video signal dropout occurring in a television line, said dropout compensator comprising:

means for providing a video signal from at least one television line adjacent to the line in which said dropout occurred;

means for providing a first dropout replacement component comprising a signal value from said video signal at a horizontal position corresponding to the position of said dropout within a television line;

means for providing a second dropout replacement component comprising a signal value from said video signal at a horizontal position corresponding to one-quarter cycle of the chrominance subcarrier frequency immediately preceding said dropout;

means for providing a third dropout replacement component comprising a signal value from said video signal at a horizontal position corresponding to one-quarter cycle of the chrominance subcarrier frequency immediately following said dropout;

means for providing a dropout replacement signal comprising means for combining said first, second and third dropout replacement components; and

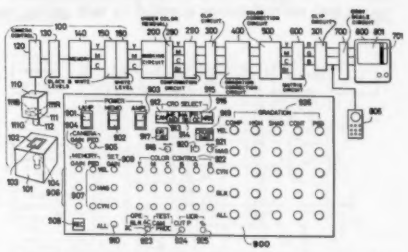
means for replacing said dropout with said dropout replacement signal.

4,250,522

COLOR FACSIMILE PREVIEWER

Ikuo Seki, Tokyo, and Masahiko Kato, Kodaira, both of Japan, assignors to Toppan Printing Co., Ltd., Tokyo, Japan

Filed Jan. 17, 1979, Ser. No. 4,289
Claims priority, application Japan, Jan. 20, 1978, 53/4348
Int. Cl.³ H04N *1/46*
U.S. Cl. 358—76 **13 Claims**



1. A color separation condition determining apparatus having a color monitor for use with a color monitor capable of presenting on a screen a color reproduction to be obtained from a color original to be reproduced by a color printing process, said color monitor means being capable of displaying colors with a given range of color densities on said screen; said apparatus comprising:

scanning means for scanning a color original and for generating first, second and third electrical signals representative of three primary color components of said color original, respectively;

masking circuit means for modifying the relative strengths of said electrical signals;

under color removal circuit means for performing under-color removal from said signals of a component representative of the black component of said color original;

gradation correction circuit means for correcting the gradations of each of said first, second and third electrical signals;

color correction circuit means for subtracting from each of said 1st, 2nd, and 3rd electrical signals secondary, tertiary and quaternary components derived from said signals and weighted by respective selected factors;

matrix circuit means for converting said electrical signals into 4th, 5th and 6th electrical signals representative respectively, of red, blue and green components of said color original, as said color original is to be reproduced on said color monitor means;

means for applying said fourth, fifth and sixth electrical signals to said color monitor such that said color monitor displays an image determined thereby; and

clip circuit means for clipping the portions of said first, second and third electrical signals at about a preselected 100% level, whereby no color densities above a preselected portion of said range of color densities is displayed on said screen.

4,250,523

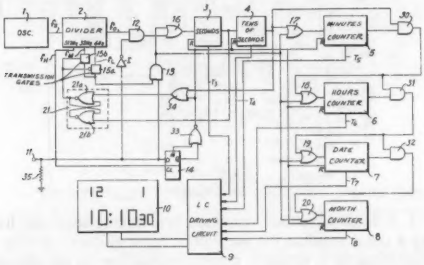
ELECTRONIC TIMEPIECE

Masami Murata, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Feb. 5, 1979, Ser. No. 9,724
Claims priority, application Japan, Feb. 3, 1978, 53/11689
Int. Cl.³ G04C *3/00*
U.S. Cl. 368—82 **7 Claims**

1. An inspection circuit for use in an electronic timepiece including timekeeping circuit means for producing a low frequency timing signal and at least one intermediate frequency signal, a plurality of series-connected counter means adapted in response to said low frequency timing signal to be applied to

said first series-connected counter means to each produce timekeeping signals representative to timekeeping information and display digit means coupled to said plurality of series-connected counter means for displaying timekeeping information in response to the timekeeping signals being applied thereto; the improvement comprising gating means coupled intermediate said timekeeping circuit means and each of said timekeeping counter means, said gating means being normally disposed in a timekeeping mode to permit said low frequency timing signal to be applied to said first series-connected counted means and control means coupled to said gating means for



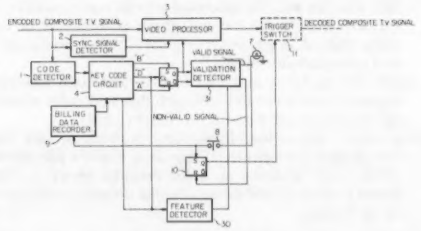
selectively disposing said gating means from a timekeeping mode to an inspection mode, said gating means being adapted in an inspection mode to simultaneously apply to each of said counter means said intermediate frequency signal produced by said timekeeping circuit means to thereby permit each of said counter means to be simultaneously inspected, said control means further including reset means coupled to each of said series-connected counter means, said reset means being adapted to reset each of said counter means when said control means selectively disposes said gating means into an inspection mode.

4,250,524

VALIDATION APPARATUS IN A PAY TELEVISION SYSTEM

Akimori Tomizawa, Konosu, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1979, Ser. No. 14,237
Int. Cl.[3] H04N *7/16, 7/10*
U.S. Cl. 358—122 **2 Claims**



1. A validation apparatus in a pay television system for receiving an encoded composite T.V. signal which has been formed by adding a sequence of code signals as a first key code to a normal composite T.V. signal in a transmitting end, and validating the accurate corresponding relation between said first key code and a second key code which is preset in a receiving end, said apparatus comprising:

a code detector means for successively detecting from said encoded composite T.V. signal said sequence of code signals;

a key code circuit means having said second key code so as to validate said sequence of code signals detected by said code detector means for generating a first, a second and a third control signals in response to said sequence of code signals;

a polarity flip-flop means being set by said first control signal, thereby assuming a first state thereof being reset by said second control signal, thereby assuming a second state thereof, and being toggled by said third control signal, thereby changing from the first state to the second state or changing from the second state to the first state;

a counter means for generating an output signal when the number of state changes in said flip-flop means reaches a predetermined value;

a feature detector means for generating an output signal when the detector means receives said third control signal a predetermined number of times which is peculiar to said sequence of code signals; and

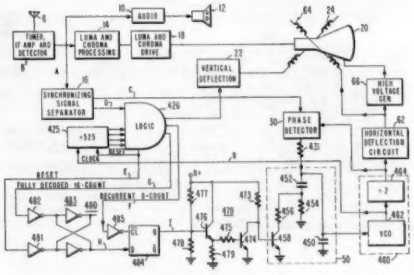
a gating means for generating an output signal so as to generate a valid signal representing that said encoded composite T.V. signal is effectively decoded when both the output signal of said counter means and the output signal of the feature detector means are input thereto at the same time.

4,250,525

TELEVISION HORIZONTAL AFPC WITH PHASE DETECTOR DRIVEN AT TWICE THE HORIZONTAL FREQUENCY

Steven A. Steckler, Clark, and Alvin R. Balaban, Lebanon, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 9, 1979, Ser. No. 37,380
Int. Cl.[3] H04N *5/04*
U.S. Cl. 358—148 **9 Claims**



1. An improved television horizontal oscillator synchronizing arrangement for a television receiver adapted for use with a source of composite television signals including horizontal rate synchronizing signal portions and which also includes synchronizing pulses at twice the horizontal rate during a first portion of the vertical blanking interval, which first portion follows initiation of the vertical synchronizing pulse, the arrangement comprising:

a synchronizing signal separator coupled to said signal source for receiving the composite television signals for producing first signals related to the horizontal rate;

phase detection means including a first input terminal and an output terminal, and also including a second input terminal which is coupled to said synchronizing signal separator for receiving said first signals;

controllable oscillator means for producing, at an output, second horizontal-rate signals, said oscillator means including a rate control input terminal;

first coupling means for coupling said oscillator means output to said first input terminal of said phase detection means to apply said second signals thereto for producing at said output terminal of said phase detection means a pulsating control signal representative of the frequency and phase difference between said first signals and said second signals;

controllable filter means coupled between said output terminal of said phase detection means and said rate control input terminal of said controllable oscillation means for closing a feedback phase-lock control loop for filtering said pulsating signals for applying said filtered signals to said controllable oscillator means, and maintaining said second signals in synchronism with said first signals, said controllable filter means also including a control input terminal by which the filter time constant can be varied; and

filter time constant control means coupled to said control input terminal of said controllable filter means for changing said filter time constant at the vertical rate;

wherein the improvement resides in that said filter time constant control means comprises timing means for inhibiting said filter time constant control means during at least a part of said first portion of said vertical blanking interval.

4,250,526

OPTICAL INFORMATION READING DEVICE

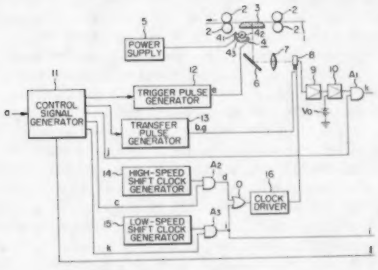
Jyoichi Fuwa, Atsugi, and Toshifumi Asakawa, Yamato, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 23, 1979, Ser. No. 41,790

Claims priority, application Japan, May 25, 1978, 53-61688

Int. Cl.[3] **H04N** *1/12*

U.S. Cl. 358—294 **2 Claims**



1. An optical information reading device for reading an image from an original document in response to a read instruction, comprising:

(a) means responsive to said read instruction for generating a trigger pulse;

(b) a light source for producing flashes of light intermittently in response to said trigger pulse, to illuminate said original document;

(c) an array of light receptors each of which may accumulate a charge representative of a corresponding picture element of the illuminated image on said original document;

(d) memory means for storing each of said accumulated charges;

(e) means coupled to said array for generating pulses to cause the transfer of the charge accumulated in each of the light receptors into said memory means in synchronism with the flashing of said light source; and

(f) means for deriving from said memory means a video output signal representative of said illuminated image.

4,250,527

SWITCHING DEVICE FOR CASSETTE TAPE RECORDERS

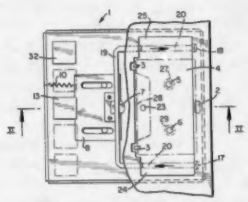
Werner Broghammer, Tennenbronn, Fed. Rep. of Germany, assignor to Dual Gebrüder Steidinger, St. Georgen, Fed. Rep. of Germany

Filed Jun. 22, 1979, Ser. No. 51,308

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1979, 2910632

Int. Cl.[3] **G11B** *21/02, 21/22, 15/18*

U.S. Cl. 360—75 **4 Claims**



1. Cassette magnetic tape device for use with a tape cassette, which on its wide side has at least one opening, through which a winding mandrel is insertable for engagement in the core of the spool of the tape and which in its narrow sides has at least one opening in which a magnetic head can be inserted, comprising

a winding mandrel means for operative engagement in the cassette,

a magnetic head,

feed means for being displaceably mounted in a plane perpendicular to the axis of said winding mandrel means for transferring said magnetic head into an operative position such that said magnetic head enters into the opening in a narrow side of the cassette, said magnetic head being secured on said feed means,

first spring means for biasing said feed means in a direction against displacement thereof into said operative position,

a solenoid circuit including a low voltage solenoid means being operatively connected with said feed means for said magnetic head for transferring said feed means against said spring means into the operative position.

a current supply means being operatively connected on the one hand with a power supply line and on the other hand being connected with said solenoid means for supplying said solenoid means with low voltage,

a power supply line connection line being connected to said current supply means and adapted to be connected to the power supply line,

a power supply switch disposed in said power supply line connection line for said current supply means,

a first contact pair of means disposed in said solenoid circuit for opening and closing said solenoid circuit, respectively,

a sensing means being operatively connected with said first contact pair of means and for being controllable by the cassette such that said sensing means holds said first contact pair means closed as long as a cassette is located in the device,

a first electronic switch disposed in said solenoid circuit in series with said first contact pair means,

a second contact pair means connected with said first electronic switch, and said second contact pair means for stably closing said first electronic switch when said second contact pair means is briefly (transiently) closed,

a first control means for setting the normal forward movement of the tape (recording or playback) being operatively connected with said second contact pair means such that said first control means closes said second contact pair means as long as said first control means is actuated,

a third contact pair means being connected with said first electronic switch, said third contact pair means for stably

opening said first electronic switch when said third contact pair means is briefly closed,

a second control means for stopping the forward motion of the tape ("stop") being operatively connected with said third contact pair means such that said second control means closes said third contact pair means as long as said second control means is actuated,

a second electronic switch disposed in said solenoid circuit in series with said first contact pair means and said first electronic switch,

a light source emitting a light beam,

a photosensitive element being disposed in the path of said light beam of said light source,

said source being disposed in the device such that said light beam is directed on said photosensitive element in a path where said light beam crosses through a space in which at least one of the fingers of a person must engage when the cassette is inserted in and removed from the device, respectively, such that said light beam is interrupted when the cassette is inserted and removed, repectively,

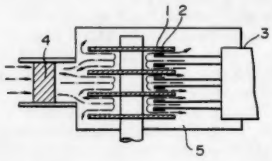
said second electronic switch being connected with said photosensitive element such that said second electronic switch interrupts said solenoid circuit for the duration of the interruption of said light beam.

4,250,528

MAGNETIC DISC RECORDING APPARATUS

Hiroyasu Oda, Kamakura, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 29, 1979, Ser. No. 25,101
Claims priority, application Japan, Apr. 18, 1978, 53-45692
Int. Cl.[3] G11B *5/012, 5/60, 5/82*
U.S. Cl. 360—98 **3 Claims**



1. A magnetic disc recording apparatus, comprising:

a plurality of magnetic discs, said discs being rotatably mounted one above another on a rotatable spindle;

a plurality of magnetic heads for communicating with said discs, said heads floating on said discs;

an air-tight chamber surrounding said plurality of discs and said plurality of magnetic heads;

means for filtering pressurized air entering said chamber;

a plurality of air flow control partitions located within said air-tight chamber, each of said partitions including a circular opening having a diameter slightly larger than the diameter of one of said magnetic discs, said partitions being positioned within said chamber such that each of said partitions is coplanar with one of said discs and such that said circular opening in said partition is concentric with said one of said discs;

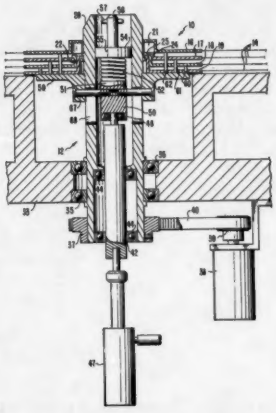
wherein air flowing between said plurality of discs is controlled by said partitions, whereby dust particles occurring between any two of said discs are prevented from contaminating the remainder of said plurality of discs.

4,250,529

METHOD AND APPARATUS FOR OPENING DISK PACKS

Stawomir P. Kleczkowski, Boulder, Colo., and Rupert F. Ross, Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 8, 1979, Ser. No. 64,675
Int. Cl.[3] G11B *5/012, 5/016, 17/02*
U.S. Cl. 360—98 **6 Claims**



1. Apparatus for opening and accessing a disk memory member pack in a plurality of concurrent access openings comprising: a plurality of disk memory members adapted for rotation around a common axis and for reciprocating axial movements; drive means mounted for rotation and adapted to engage the disk memory members for co-rotation, the drive means including a plurality of axially extending pins of varying lengths and arranged by length into sets of pins with each set of pins having pins spaced circumferentially apart; pin mount means in said drive means to axially movably mount said axially extending pins for co-rotation with said drive means, actuator means in said drive means and co-rotatable with said axially extending pins and operatively connected to said pins to axially urge all pins in one set of pins to move in a first axial direction for selecting a disk memory member for accessing by axially pushing same to create an enlarged access opening between the pushed disk and an adjacent disk while said drive means is rotating; and at least two of said disk memory members having a plurality of sets of openings, said opening sets being arranged in configurations corresponding to the predetermined configurations of the sets of pins with adjacent disk members having a set of openings thereon to admit a set of pins through only one of the adjacent disk memory members, whereby the disk memory members may be axially separated by axially moving the pin sets in said first axial direction through the corresponding sets of openings therein and axially engaging the individual disk memory members not having corresponding openings with the terminal portions of the pin sets.

4,250,530

FIXED AND MOVABLE SUPPORTING OF DUAL MAGNETIC HEADS

Charles S. Yang, Santa Barbara, Calif., assignor to Yang Electromagnetic Systems Inc., Ventura, Calif.

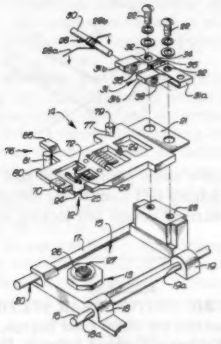
Continuation of Ser. No. 938,437, Aug. 31, 1978, abandoned.
This application Oct. 5, 1979, Ser. No. 82,108
Int. Cl.[3] G11B *21/22, 5/54, 5/60*
U.S. Cl. 360—105 **26 Claims**

1. For use with a magnetic medium having opposite magnetic surface extents, the combination comprising

(a) a pair of magnetic transducers, and a pair of arms sup-

porting said transducers in opposed facing relation for magnetic coupling to said medium magnetic surface extents, means mounting one of said arms for movement toward and away from the other arm,

(b) each of said transducers having an air bearing pad means defining a pair of generally parallel, outwardly projecting rails which are spaced apart, said rails extending in the direction of magnetic media travel between and relative to said transducers, said rails generating an air bearing to



space the transducer relative to said media upon movement of said media,

(c) and including flexure means carrying each transducer, each flexure means providing substantially universal pivoting of the associated transducer, each flexure means including a web supporting the associated transducer, the web extending in the general direction of said rails, and a pivot engaging the associated transducer to pivot same substantially universally.

4,250,531

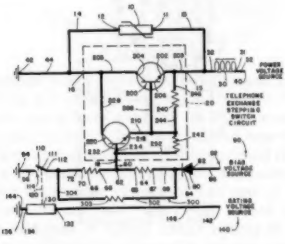
SWITCH-ARC PREVENTING CIRCUIT

Walter C. Ahrens, 3228 S. 128th Ave., Omaha, Nebr. 68144

Filed Aug. 30, 1979, Ser. No. 71,107

Int. Cl.³ H02H *7/22*

U.S. Cl. 361—2 **4 Claims**



1. An arc preventing continuous current pulsed electrical circuit for telephone networks which provides substantially self-preserving and switch-preserving characteristics over a broad range of inductive coil resistances comprising: a continuous current power source having first and second poles, a protected two-terminal switch having first and second make-break contacts and means for closing same, an inductive coil of a stepping solenoid of a telephone exchange circuit system, gating means comprising a gating pulse source having first and second poles, biasing means comprising a biasing voltage source having first and second terminals, means for closing said protected switch comprising a pulsed-continuous-current solenoid, a gating pulse source of a telephone exchange and having first and second poles, said pulsed-continuous-current solenoid having a controlling mechanical linkage with said protected switch, means connecting said first pole of said gating pulse source to a first terminal of said pulsed-continuous-current solenoid, and means connecting a second terminal of said solenoid to said second pole of said gating pulse source, a protective two transistor electronic switching means comprising a first transistor having first and second power electrodes, and a control transistor in controlling circuit with said first transistor, said first pole of said continuous current power source being connected to a first side of said coil, said coil having a second side connected to said first power electrode of said first transistor, means connecting said second power electrode of said first transistor to said second pole of said power source, a blocking diode having first and second electrodes, means connecting said first terminal of said bias voltage source to said first electrode of said blocking diode, a voltage dividing resistor network having first and second resistors each having first and second non-polarized sides, said first resistor being of much higher resistance than said second resistor, said first side of said first resistor being connected to said second electrode of said blocking diode, a conductor connecting said second side of said first resistor to the first side of said second resistor, means connecting said conductor to the base of said control transistor, said second side of said second resistor being connected to said first contact of said protected switch, means connecting said second contact of said protected switch to said second terminal of said bias voltage source, a metal oxide varistor having first and second poles, means connecting said first pole of said varistor to said first power electrode of said protective switching means, means connecting said second pole of said varistor to said second power electrode of said protective switching means, whereby arcing is non-existant of said contacts of said protected switching means, and whereby said circuit is sensitive to operate on very low current whereby it is versatile to operate over a broad range of coil resistances.

4,250,532

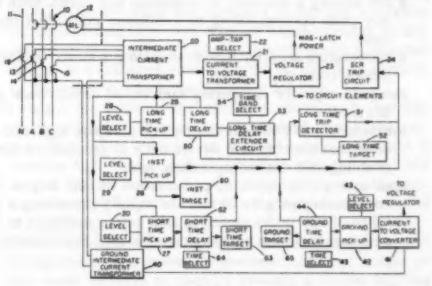
ELECTRONIC OVERCURRENT DETECTION AND TRIPPING CIRCUIT

Lee A. Davis, Audubon, N.J., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Feb. 12, 1979, Ser. No. 11,388

Int. Cl.³ H02H *3/08*

U.S. Cl. 361—96 **7 Claims**



1. An electronic trip circuit for a multiphase circuit breaker; said circuit including, in combination:

current transformer means connected to each of said phases and producing an output signal related to the instantaneous current carried by said multiphase circuit breaker;

long time, short time and instantaneous pickup circuits;

semiconductor switching means connected to said circuit breaker and operable to trip said circuit breaker in response to the turning on of said switching means;

long time, short time and instantaneous target indicators;

a long time delay circuit and a short time delay circuit con-

nected to said long time and short time pickup circuits respectively;

said long time delay, short time delay and instantaneous pickup circuits connected to said long time, short time and instantaneous target indicators respectively;

said long time delay, short time delay and instantaneous pickup circuits each connected to said semiconductor switching means and operable to turn on said switching means in response to respective given input current conditions;

means for selectively disabling said long time delay circuit, said short time delay circuit and said instantaneous pickup circuit to enable the selective test of their respective functions;

said means for selectively disabling including respective tap block means for each function having a respective removable pin position which disables said respective function.

4,250,533

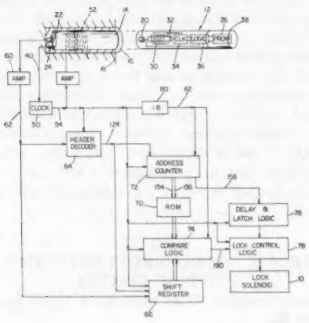
SECURITY SYSTEM

Avi N. Nelson, 37 Alberta Rd., Brookline, Mass. 02167

Filed May 21, 1979, Ser. No. 40,562

Int. Cl.³ E05B *47/00*

U.S. Cl. 361—172 **12 Claims**



1. A security system for control of a desired operation comprising

a key storing a plurality of multidigit key codes, each said key code corresponding to a different controlled operation,

a cooperating security device including a stored multidigit device code,

compare logic for comparing said stored device code with key codes,

means responsive to detection by said compare logic of a key code that matches said device code to generate an output enabling said desired operation, and

scan means responsive to presentation of said key to said cooperating security device for rapidly presenting a plurality of key codes stored in said key in sequence to said compare logic for comparison with said device code.

4,250,534

PACKAGED ELECTRICAL CAPACITOR

Donald R. Brown, Downers Grove; Otto T. Masopust, Jr., Cicero, and John R. Meal, Naperville, all of Ill., assignors to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 16,045, Feb. 28, 1979. This application Feb. 22, 1980, Ser. No. 123,604

Int. Cl.³ H01G *1/02*

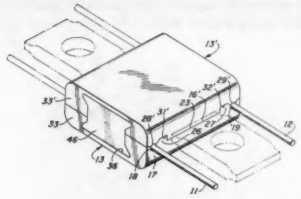
U.S. Cl. 361—272 **8 Claims**

1. A boxed electrical device having terminal portions, which comprises:

a first box half having flared openings extending from opposed edge sections for receiving the electrical device;

a second box half substantially identical in construction with said first box and seated on top of said first box half with the flared openings in alignment with the flared openings in said first box half;

a pair of leads extending through the juncture of the non-flared edges of said box halves into proximity with the terminal portions of the electrical device; and



slugs of conductive metal positioned in said aligned flared openings for joining said leads to the terminal portions of said boxed electrical device and locking said box halves together.

4,250,535

ELECTRIC SWITCH GEAR SECTION

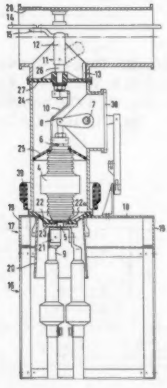
Erich Adolph, Frankfurt am Main; Ünal Bayrak, Bischofsheim; Robert Prohl, Nidderau; Gerhard Schmidt, Darmstadt-Wixhausen, and Walter Stecker, Heusenstamm, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 20, 1979, Ser. No. 32,007

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1978, 2818905

Int. Cl.³ H02B *1/04*

U.S. Cl. 361—335 **11 Claims**



1. In an electric switchgear section having plural phases, of which each phase has metal encapsulation which is adapted to be filled with insulating gas and which encloses at least one vacuum switching tube having a fixed axial current connection and an axial current connection movable by means of a lever turning on a shaft extending out of the encapsulation, the fixed connection being connected to a cable termination and the movable connection being connected, via a flexible lead, to an encapsulated disconnect switch whose movable contact can be swung into contact with a ground or with a mating contact on a bus bar, the improved structure wherein each phase comprises:

the cable termination being located in a top part supported by an understructure both of which are common to all phases and are at atmospheric pressure,

the termination having a screw connection and being surrounded by a vertical shield which is removably fastened at its upper end to a feedthrough plate carried by the top part and which extends through the top part into the understructure, there being an electrically conducting plate carried on the underside of the feedthrough plate which is connected to the cable termination and receives the fixed current connection,

the feedthrough plate supporting, via an interposed gasket, the fixed connection and the lower end of the vacuum switching tube connected thereto as well as one end of a vertical, non-metallic container forming part of the encapsulation,

a disc of insulating material for centering the vacuum switching tube being contained within the container,

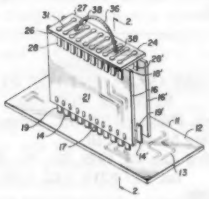
a bulkhead for closing, gas-tight, the vertical container at the top and having a vertical bolt passing therethrough on the lower end of which is carried the flexible lead connecting the movable connection of the vacuum switching tube and the upper end of which extends into a gas-tight, non-magnetic, horizontal container arranged on the bulkhead for enclosing the bus bar, and

the end of the vertical bolt in the horizontal container supporting a movable contact of the disconnect switch for motion between a grounding contact and a bus bar contact.

4,250,536
INTERCONNECTION ARRANGEMENT FOR CIRCUIT BOARDS

Jerry M. Barringer, Forest, and Raymond W. Harris, Evington, both of Va., assignors to General Electric Company, Lynchburg, Va.

Filed Dec. 26, 1978, Ser. No. 973,358
Int. Cl.[3] H05K *1/14*
U.S. Cl. 361—413 **5 Claims**

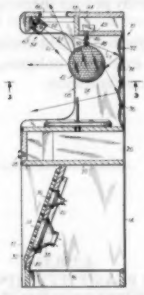


1. A circuit board mounting arrangement comprising, in combination: a base integrated circuit board having a printed circuit and a plurality of apertures for accommodating connector pins; a pair of hybrid integrated circuit boards each having a lower edge and an upper edge and a printed circuit thereon; a plurality of connector pins arranged at predetermined intervals on the lower edge of each of said pair of hybrid circuit boards, inserted into said base circuit board apertures, and mounting said pair of hybrid circuit boards in adjacent relationship on said base circuit board in an upstanding position on said base circuit board; contact means positioned on the upper edge of each of said hybrid circuit boards and connected to the printed circuit on the respective hybrid circuit board, said contact means on said hybrid circuit boards comprising a plurality of contact terminals arranged in spaced relation on the upper edge of each of said pair of hybrid circuit boards; a secondary integrated circuit board having a printed circuit and pair of side edges; and contact means on said secondary circuit board adjacent each of said side edges in releasable engagement with said contact means on the upper edges of said hybrid circuit boards, said contact means on said secondary circuit board comprising a plurality of downwardly extending pairs of spring fingers for releasably accommodating one of said contact terminals on an associated hybrid circuit board, whereby said secondary circuit board and said hybrid circuit boards are held together in an operative position to interconnect the printed circuits on each of said pair of hybrid circuit boards.

4,250,537
DISCOTHEQUE SIMULATING HOME ENTERTAINMENT SYSTEM

George P. Roegner, Far Hills, N.J.; Richard Hawley, Santa Claus, Ind.; Howard Steen, Santa Claus, Ind., and Sig Biener, Santa Claus, Ind., assignors to Soundesign Corporation, Jersey City, N.J.

Filed May 17, 1979, Ser. No. 40,150
Int. Cl.[3] F21V *7/04, 33/00*; G11B *1/04*
U.S. Cl. 362—86 **22 Claims**



1. An entertainment system for simulating the sound and lighting effects of a discotheque in a room in which the entertainment system is located, comprising:

(a) an upright support for supporting the entertainment system on the floor of the room;

(b) sound-generating means mounted on the support and operative for transmitting amplified sounds;

(c) a mirrored generally ball-shaped globe mounted on the support for rotation about a vertical axis, said mirrored globe having a plurality of reflecting surfaces located on its outer surface;

(d) light-generating means mounted on the support at a location remote from the mirrored globe, and operative for transmitting light rays, some of which impinge on and reflect off the mirrored globe to thereby project reflected images in a scattered pattern on the surrounding surfaces of the room in which the system is located;

(e) means for rotating the mirrored globe such that the projected reflected images are scanned across the surrounding room surfaces to thereby project thereon a moving light pattern which together with the amplified sounds transmitted by the sound-generating means simulate the amplified sound and moving light environment of a discotheque;

(f) additional light-reflecting means mounted on the support for increasing the number of scattered reflected images on the room surfaces to thereby provide a denser lighting pattern, including a reflecting panel mounted on the support and having a rear reflecting portion which is located rearwardly of the globe and which extends in a direction generally parallel to said vertical axis;

(g) said additional light-generating means being mounted on the support at a location forwardly of the mirrored globe such that first ones of the light rays are transmitted rearwardly towards the globe for direct impingement thereon and thereupon for reflection therefrom, and such that second ones of the light rays are transmitted rearwardly past the mirrored globe without impinging directly thereon;

(h) said rear reflecting portion being located in the paths of some of said first and second rays such that some of said

first rays are reflected from said rear reflecting portion in a direction generally away from the globe, and such that some of said second rays are reflected back towards the globe for direct impingement thereon and for subsequent reflection therefrom;

(i) said rear reflecting portion having an array of generally cup-shaped reflecting domes thereon which are so configurated such that said some second light rays are focused back towards the globe for direct impingement thereon and for subsequent reflection therefrom, whereby said some second light rays which impinge the turning globe directly from the reflecting domes as well as the first light rays which impinge the turning globe directly from the light-generating means are all scanned across the room surfaces to thereby project thereon a moving light pattern; and

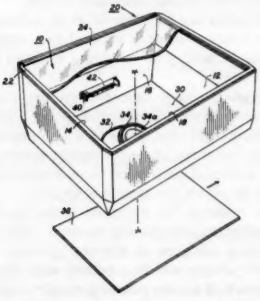
(j) said domes being arranged in horizontally-extending rows and vertically-extending columns, each dome having a part-spherical configuration.

4,250,538

FULL FRAME FLASH ILLUMINATION SYSTEM UTILIZING A DIFFUSE INTEGRATING OPTICAL CAVITY

John A. Durbin, Webster, and James D. Rees, Pittsford, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 26, 1979, Ser. No. 15,558
Int. Cl.³ G09F *13/04*
U.S. Cl. 362—97 **10 Claims**



1. A full-frame illumination system for a document copying machine comprising:

a housing having a top surface defining an object plane and containing a platen supporting a document to be copied, a bottom surface accommodating a lens for focusing an image of a document onto an image plane, said housing completely enclosed by side walls joined to said top and bottom surfaces, said housing further characterized by having its interior surfaces completely covered with a high reflectivity material such that said surfaces are highly diffusely reflective to light incident thereon,

a single flash illumination source positioned within said housing between said top and bottom surfaces, and

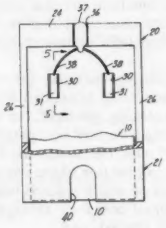
means to intermittently pulse said illumination source to produce light flashes which undergo multiple reflections from said coated surfaces to provide a uniformly diffuse irradiation at the platen.

4,250,539

SUPPORTING MEANS FOR AN ELECTRICAL CIRCUIT

William O. Leitzel, 58 Sycamore Ave., Mill Valley, Calif. 94941, and Tom Thinesen, 512 S. Cashmere Ter., Sunnyvale, Calif. 94087

Filed Feb. 21, 1979, Ser. No. 13,394
Int. Cl.³ B62J *5/00*
U.S. Cl. 362—196 **4 Claims**



1. Supporting means for an electrical circuit comprising:

a generally rectangular battery having a thickness less than one-fourth inch and provided with a pair of output terminals,

a relatively flat housing having a pair of opposite generally rectangular sides,

means securing said sides together in spaced apart relation and spacing said sides apart a distance about equal to the thickness of said battery,

an electrical circuit,

said circuit having a pair of normally open contacts supported by said housing,

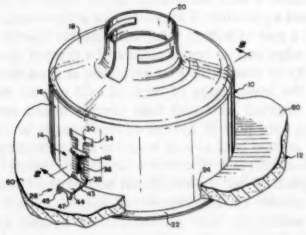
said battery being slidable in said housing toward and away from said contacts for engaging and disengaging said contacts relative to said terminals for closing and opening said circuit.

4,250,540

MOUNTING ARRANGEMENT FOR RECESSED LIGHT FIXTURE HOUSING

Paul J. Kristofek, Hickory Hills, Ill., assignor to McGraw-Edison Co., Rolling Meadows, Ill.

Filed Aug. 23, 1979, Ser. No. 68,933
Int. Cl.³ F21S *1/02, 3/02*
U.S. Cl. 362—368 **7 Claims**



1. An arrangement for mounting an enclosed light fixture housing having an open end with a flange formed about the periphery thereof, on a planar support member having first and second surfaces in an aperture therein dimensioned similarly to the dimension of said housing, said housing being receivable in said aperture with the flange engaging said first surface of the support member, said arrangement including in combination:

a side wall of said housing defining a slotted aperture, locking means provided on said side wall adjacent said slotted aperture and mounting clip means receivable in said slot-

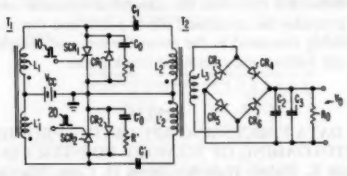
ted aperture from the interior of said housing, whereby said clip means is captured in said slot for sliding movement therein toward and away from said support member, said mounting clip means including a first tab for engaging the second surface of said support member upon moving said mounting clip means toward said support surface and a second locking tab for engaging said locking means thereby to maintain said first tab in engagement with said support surface, whereby said light fixture housing is releasably secured on said support member.

4,250,541

PUSH-PUSH RESONANT POWER INVERTER

Zung F. Chang, Flemington, and Robert Minton, Piscataway, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 7, 1979, Ser. No. 101,165
Int. Cl.³ H02M *3/315*
U.S. Cl. 363—28 **3 Claims**



1. A DC-to-AC inverter, comprising

an output circuit including a transformer having first and second primary coils.

first and second resonant circuit loops each including a capacitor, one of said primary coils, a silicon control rectifier providing a current path in one direction around the loop, and a conventional diode providing a current path in the opposite direction around the loop,

first and second charging chokes on a common core,

a DC source connected to supply a charging current to the capacitor in said first resonant circuit loop through a charging loop path including said first charging choke and said first coil, and, to the capacitor in said second resonant circuit loop through a charging loop path including said second charging choke and said second primary coil, the charging choke and primary coil in each charging loop path being phased to supply voltages which add to the voltage of the DC source, and

means periodically and alternately to render conductive the rectifiers in the first and second resonant circuit loops each to start a cycle of oscillation of current through the rectifier in one direction, followed by current through the diode in the opposite direction in one resonant circuit loops, while the DC source provides current to charge the capacitor in the other resonant circuit loop through the respective charging choke and primary coil.

4,250,542

METHOD FOR CONTROLLING OPERATING CONDITIONS OF D.C. TRANSMISSION LINE AND CONTROL DEVICE FOR EFFECTING SAME

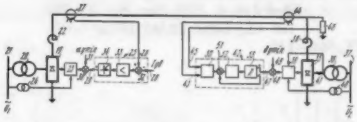
Evgeny K. Bulakhov, Napolny proezd, 12, kv. 114, and Igor B. Fedyaev, ulitsa Rashupkina, 7, kv. 175, both of Moscow, U.S.S.R.

Filed Aug. 31, 1978, Ser. No. 938,520
Int. Cl.³ H02J *3/36*
U.S. Cl. 363—35 **43 Claims**

1. A method of controlling operating conditions of a DC transmission line including a rectifier substation and an inverter substation, said method comprising the steps of

maintaining a predetermined current value at the rectifier substation by controlling the voltage at said rectifier substation to decrease said voltage when the current at said rectifier substation increases above the predetermined value and to increase said voltage when said current decreases; and

controlling the voltage at the inverter substation to maintain an extreme value of a controlled variable formed as a



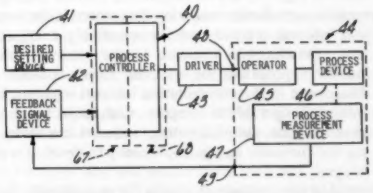
function of parameters based on operating parameters of said inverter substation thereby insuring a maximum possible voltage at said inverter substation while maintaining the predetermined current value when the extreme value is reached.

4,250,543

METHOD OF CONTROLLING PRODUCTION PROCESSES AND APPARATUS THEREFOR

Richard L. Smith, Livonia, and Kent Van Allen, Beverly Hills, both of Mich., assignors to Scans Associates, Inc., Livonia, Mich.

Filed Jul. 21, 1978, Ser. No. 926,913
Int. Cl.³ G05B *11/42, 13/02*
U.S. Cl. 364—105 **67 Claims**

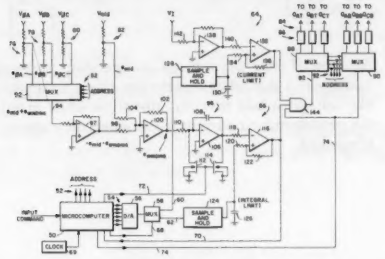


1. A method of controllinga process using a process controller including the steps of providing a desired value signal to said process controller related to the condition to which it is desired to set said process, providing a feedback signal to said process controller from the process being controlled indicating the current state of the process, producing a correction signal from said signals which will look ahead and attempt to become saturated as soon as a new desired value is supplied or a process change occurs by utilizing the rate of change of said signals and the error difference between said signals, which will remain unchanged as long as the process being controlled, and the desired value signal both remain unchanged and in a static condition, which will, if saturated, be brought out of saturation by utilizing said error difference and said rate of change in a manner to change said correction signal in value much faster than if said error difference only were used, and which will, if said process is in a dynamic condition, be changed in a series of occurrences to a value smaller in magnitude, but of either polarity, until it arrives at a value related to said condition it is desired to set said process to, and utilizing said correction signal to cause said process to arrive at said desired condition.

4,250,544
COMBINATION MICROPROCESSOR AND DISCRETE ELEMENT CONTROL SYSTEM FOR A CLOCK RATE CONTROLLED ELECTRONICALLY COMMUTATED MOTOR

Robert P. Alley, Manlius, N.Y., assignor to General Electric Company, Louisville, Ky.

Filed Jan. 4, 1980, Ser. No. 109,586
Int. Cl.[3] G06F *15/46*; H02P *6/02*
U.S. Cl. 364—110 **8 Claims**



1. A hybrid microcomputer/discrete element control system for an electronically commutated motor having a rotor and a plurality of stator windings operable to produce magnetic fields in response to selective winding energization, said system comprising:

a source of substantially fixed rate basic clock pulses;

a digital computer operating under stored program control, said computer having memory elements for storing data including a present commutation interval register serving as a commutation sequence counter, a clock-pulses-per-interval register serving to record a representation of desired rotational velocity, an internal counter register serving to accumulate a count of basic clock pulses for comparison with the contents of the clock-pulses-per-interval register, and an established current limit register;

means for periodically receiving data stored in the commutation interval register and for selectively energizing the motor windings in response to the received data in a manner appropriate for effecting motor rotation as the data stored in the commutation interval register changes;

an integrator operable to integrate, with respect to time from an initial state, sampled voltage induced in a motor winding not currently energized, thereby to develop a voltage integral;

controlled selector switch means for periodically receiving data stored in the commutation interval register and for selectively connecting the input of said integrator to a currently unenergized motor winding;

a comparator operable to compare the voltage integral to a predetermined reference voltage level and to provide an output signal when the voltage integral exceeds the reference voltage level indicating the rotor has reached a predetermined angular position, and means enabling said computer to periodically sense the output of said comparator;

means for periodically receiving and storing a representation of data in the established current limit register;

means for sensing current through energized motor windings;

a comparator for comparing sensed motor winding current with the stored representation of data in the established current limit register;

a controlled switching device responsive to the output of said motor winding current comparator and connected to interrupt energization of an energized motor winding when sensed current exceeds the established current limit, and to restore motor winding energization when sensed current falls below the established current limit by at least a predetermined amount;

said digital computer operable to establish periodic command clock pulses by incrementing the interval counter register in response to fixed rate basic clock pulses until the contents of the interval counter register have a predetermined relationship to the contents of the clock-pulses-per-interval register;

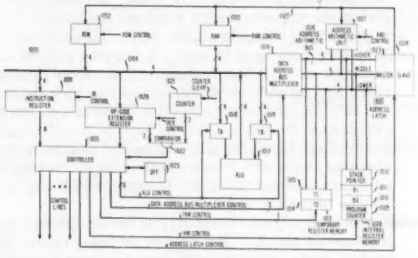
said digital computer operable to periodically increment or decrement the contents of the present commutation interval register in response to the periodic command clock pulses and to transmit these register contents as data to said means for selectively energizing the motor windings and to said controlled selector switch means; and

said digital computer operable to periodically sense the output of said comparator operable to compare the voltage integral and to adjust the contents of the established current limit register depending upon the relative times of occurrence of the command clock pulses and the integral comparator output signal, the current limit being decreased in the event the integral comparator output signal precedes the command clock pulse, and the current limit being increased in the event the integral comparator output follows the command clock pulse.

4,250,545
DATA PROCESSING APPARATUS PROVIDING AUTOLOADING OF MEMORY POINTER REGISTERS

Donald E. Blahut, Holmdel; David H. Copp, Morristown, and Daniel C. Stanzione, Marlboro, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 29, 1978, Ser. No. 974,363
Int. Cl.[3] G06F *9/34*
U.S. Cl. 364—200 **3 Claims**



1. A CPU of a data processing system designed for executing a program of instructions through a sequence of instruction cycles, the instructions being stored in memory means having multiple addressable locations including locations for storing data, the CPU including:

(a) means for coupling to the memory means for storing instructions and data, the instructions comprising a first kind having an address portion which includes an address of a memory location containing data, and a second kind having an address portion which refers to a memory pointer register for an address of a memory location containing data, the data comprising operands and op-code extension words;

(b) means for retrieving an instruction from the memory means in each instruction cycle;

(c) means responsive to the retrieved instruction for retrieving from memory means data specified by the address portion of the instruction;

(d) a memory pointer register for storing an address of a memory location containing data for reference by an instruction of the second kind;

(e) an op-code extension register for storing an op-code

extension word and having a designated bit position associated with the memory pointer register;

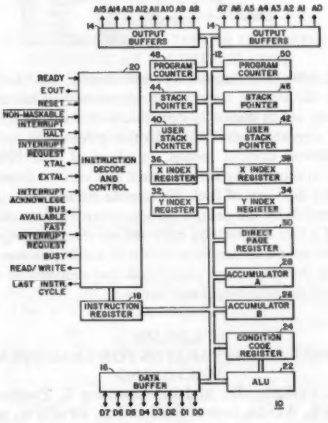
(f) means responsive to a special instruction for transferring to the op-code extension register an op-code extension word specified by the special instruction, the contents of the op-code extension register being altered only when the CPU executes a special instruction;

(g) means responsive to the address portion of a retrieved instruction and to the designated bit position in the op-code extension register for transferring to the memory pointer register during an instruction cycle the address included in a retrieved instruction of the first kind if the designated bit position contains a first logic state.

4,250,546
FAST INTERRUPT METHOD

Joel F. Boney; Fuad H. Musa, and Terry F. Ritter, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 872,857, Jan. 27, 1978, abandoned. This application Jul. 31, 1978, Ser. No. 929,482
Int. Cl.³ G06F *9/46*
U.S. Cl. 364—200 **4 Claims**



1. A method of providing a fast interrupt for a microprocessor capable of responding to more than one type of interrupt request and having a plurality of registers including a program counter register and a condition code register so that an interrupt can be serviced in a shortened response time by only stacking contents of two of the plurality of registers while other types of interrupt requests require Stacking Contents of more than two of the plurality of registers, the microprocessor being capable of servicing a plurality of interrupts with at least one of the interrupts being maskable by setting an interrupt mask bit in the condition code register, comprising the steps of:

receiving a fast interrupt request;

setting a flag bit location in the condition code register to a first state to indicate fast interrupt reguest;

placing contents of the program counter and condition code registers onto a storage means;

setting at least the interrupt mask bit in the condition code register to prevent the at least one interrupt from being recognized during the fast interrupt;

performing an interrupt routine;

returning the contents to the condition code register from the storage means;

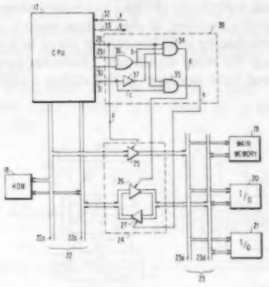
verifying that the flag bit location in the condition code register is in the first state; and

returning the contents to the program counter from the storage means.

4,250,547
INFORMATION PROCESSING APPARATUS CAPABLE OF EFFECTING PARALLEL PROCESSINGS BY USING A DIVIDED COMMON BUS

Keiji Matsumoto, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Aug. 28, 1978, Ser. No. 937,371
Claims priority, application Japan, Aug. 27, 1977, 52/103362
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—200 **9 Claims**



1. An information processing apparatus comprising:

a processor unit for manipulating data under control of programmed instructions;

a read only memory unit for storing said programmed instructions and offering said instructions to said processor unit;

a main memory unit for storing at least one of said data and preset programmed commands;

at least one peripheral unit for receiving or providing at least one of said data and said preset commands;

a common bus coupled to said processor unit, said read only memory unit, said main memory unit and said peripheral units

gating means provided in said common bus for dividing said common bus in response to a divide command so as to separate said processor unit and said read only memory unit from said main memory unit and said peripheral unit, said gating means including transfer gates having on and off states which pass and cut-off (i) said data, (ii) said programmed instructions and (iii) said preset commands in response to said on and off states;

means for detecting said divide command; and

controlling means responsive to an output of said detecting means for controlling said on and off states of said transfer gates.

4,250,548
COMPUTER APPARATUS

Jerry L. Kindell, Glendale, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Jan. 2, 1979, Ser. No. 407
Int. Cl.³ G06F *5/00, 3/00*
U.S. Cl. 364—200 **21 Claims**

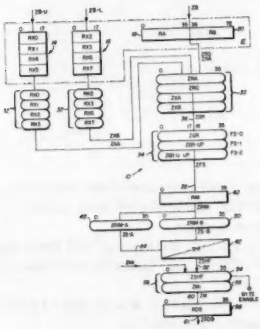
1. In combination:

a plurality of addressable registers, each register having a register boundary and each register adapted to have stored in it a binary number divisible into a number of characters with the number of characters being within a predetermined range, and with each character of any given binary number having a predetermined number of bits; said binary numbers being stored in said registers with the bits of each binary number being right justified against a register boundary;

format switch means having a boundary connected to the addressable registers to which format switch means is

applied bits stored in a designated one of said registers for unpacking the characters of the binary number if the number of bits per character is less than the number of bits in a byte, where a byte equals the number of bits in a character or that number plus one, to produce a format switch output word, the bytes of the format switch output word containing characters of the binary number being right justified against a boundary corresponding to the boundary of the addressable register in which the binary number was stored;

shifter means for receiving said format switch output word, and having a shifter output bus operatively connected to the format switch for shifting bytes containing characters of the binary number in the format switch output word and for producing a shifter output word in which the byte containing the most significant character occupies a predetermined byte position in the shifter output word and



with other bytes containing characters of the number arranged in order;

shifter output switch means connected to the shifter output bus; and

data out register means operatively connected to the shifter output switch means for storing words applied to the data out register means by the shifter output switch means, said shifter output switch means applying a first word to the data out register means containing bits of the byte position containing the most significant character of the binary number with bytes containing less significant characters of the binary number being placed in order of decreasing significance from left to right, and subsequently for applying to the register means a second word containing bytes with characters of lesser significance than those in the first word, with the bytes containing characters of the binary number in the second word being left justified against a word boundary of the register.

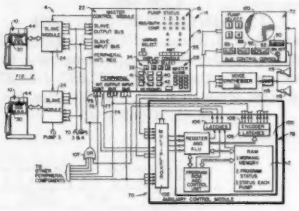
4,250,549
Patent Not Issued For This Number

4,250,550
FUEL DELIVERY CONTROL SYSTEM

Donald W. Fleischer, Wetherfield, Conn., assignor to Veeder Industries Inc., Hartford, Conn.

Filed Mar. 9, 1979, Ser. No. 18,992
Int. Cl.[3] G06F *15/56;* B67D *5/14*
U.S. Cl. 364—465 **12 Claims**

1. In a hybrid fuel delivery system having separate self-service and attendant-operated fuel delivery areas with a plurality of separate self-service and attendant-operated fuel delivery dispensers respectively and a fuel delivery control system having a first central station control system electrically connected to each self-service dispenser and comprising register means selectively operable for registering the amount of a completed fuel delivery by each self-service dispenser and first control means with a first set of manually operable switches and selectively manually operable thereby to selectively activate each self-service dispenser for self-service delivery of fuel and selectively operate the register means to register the amount of a completed fuel delivery by each self-service dispenser, the improvement wherein the fuel delivery control system further comprises a second remote station control system having remote sound annunciator means selectively operable for audibly annunciating the amount of a completed fuel delivery at the separate self-service and attendant-

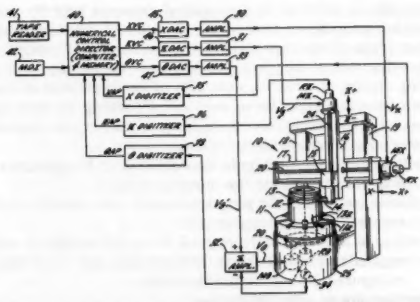


operated areas and second control means electrically connected to the central station control means and having a second remote set of manually operable switches and selectively manually operable thereby to selectively remotely operate the central station control means, in place of said first set of switches, to selectively activate each self-service dispenser for self-service delivery of fuel, the remote station control means being operable by the central station control means after completion of a fuel delivery by each self-service fuel dispenser to operate the sound annunciator means to audibly annunciate the amount of the respective completed fuel delivery at the self-service and attendant-operated areas.

4,250,551
METHODS AND APPARATUS FOR LEAD SEGMENT MACHINING

Gerald E. Paveglio, Jr., Malone; Lawrence C. Poehlman, and Richard L. Werdin, both of Fond du Lac, all of Wis., assignors to Giddings & Lewis, Inc., Fond du Lac, Wis.

Filed Jul. 11, 1979, Ser. No. 56,728
Int. Cl.[3] G05B *19/18*
U.S. Cl. 364—474 **16 Claims**



1. The method of cutting a lead segment in the cylindrical surface of a workpiece driven relative to a cutter about a rotational axis (herein called the θ axis) in a turning machine responsive to (i) first signals designating the θ axis starting location for the segment, (ii) second signals designating the desired lead ratio for the segment, and (iii) third signals desig-

nating Z axis ending location for the segment, the machine having means for driving the cutter relative to the workpiece along X and Z axes which lie respectively normal and parallel to the rotational axis, said method comprising

(1) producing fourth signals which dynamically represent the θ axis actual position of the workpiece,

(2) measuring off successive equal time periods ΔT,

(3) using the first and fourth signals to detect when the θ axis actual position becomes substantially equal to the segment starting location,

(4) producing command signals representing the command position of the cutter along the Z axis,

(5) in response to and after said detection, using said fourth and second signals to change said command signals during each period ΔT by an amount proportional to the product of (i) the desired lead ratio and (ii) the amount by which the θ axis position has changed in the time span of one ΔT, and

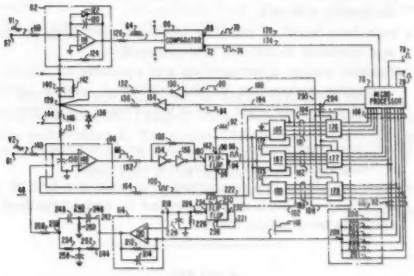
(6) terminating said step (5) when said command signals become approximately equal to said third signals,

(7) using said command signals to actuate the Z axis driving means so as to keep the Z axis actual position substantially in agreement with such command signals.

4,250,552
AC ELECTRIC ENERGY METER UTILIZING A COUNTER AS AN INTEGRATOR

Robert T. Elms, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 10, 1979, Ser. No. 73,825
Int. Cl.³ G01R *21/00*
U.S. Cl. 364—483 **28 Claims**



1. A meter apparatus computing the area of an indicator diagram for determining the value of an AC electric energy quantity defined by a voltage and a current component, and utilizing a counter as an integrator, comprising:

input means producing a first input signal representative of said voltage component and a second input signal representative of the time derivative of said current component;

means integrating said first input signal and producing an integral signal;

means comparing the instantaneous magnitude of said integral signal to the magnitudes of fixed and predetermined reference potentials;

calculating means producing, in response to said means for comparing, two control signals resetting said means for integrating;

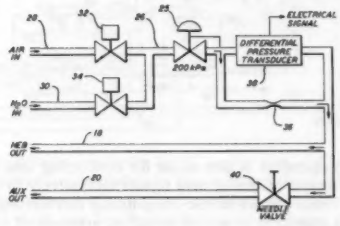
means producing, in response to said second input signal, a count control signal having a first state and a second state such that for a given time period the ratio of the time said count control signal is in said first state to said total time period is representative of the rate of change in the magnitude of said second input signal during said time period; and

means producing, in response to said count control signal, a digital count representative of the instantaneous magnitude of the time integral of said second input signal, and producing, in response to said control signals, sample values of said digital count, said calculating means accumulating successive sample values and producing totalized values representative of the time integral of the product of said current component times the time integral of said voltage component, said calculating means further producing, in response to said totalized values, output signals representative of said AC electric energy quantity.

4,250,553
FLUID FLOW MEASUREMENT SYSTEM

Carl R. Sebens, Stratford, and Chester G. Fisher, Southport, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Mar. 5, 1979, Ser. No. 17,867
Int. Cl.³ G06F *15/32*; G01F *1/36*; G01J *3/42*; G01N *31/12*
U.S. Cl. 364—510 **5 Claims**



1. A fluid measuring and control system for the burner in atomic spectroscopy comprising:

a fluid flow conduit having an inlet port and an outlet port for transmitting fluid under pressure from said inlet port to said outlet port;

a first restriction in said fluid flow conduit providing a pressure drop thereacross;

a second restriction in said fluid flow conduit downstream of said first restriction;

a boost conduit in communication with said fluid flow conduit at a location therealong between said first restriction and said second restriction and lying in communication with said outlet port, said boost conduit having a third restriction therein;

a sensor for sensing the pressure drop across said first and said second restrictors and providing an output signal proportional to said pressure drop;

means operable on said signal for providing a substantially linear indication of said pressure drop as a function of the rate of flow of the fluid through said conduit;

means in said flow conduit downstream of said first and said second restrictions for adjusting the flow through said conduit to a predetermined flow in accordance with said indication; and

means for enabling flow through said fluid flow conduit and said boost conduit simultaneously.

4,250,554
SYSTEM FOR ORDERED MEASUREMENT AND COMPUTATION

Herbert Blum, 100 De Mott Ave., Rockville Centre, N.Y. 11570, and Kevin B. Austin, Ridgewood, N.Y., assignors to Herbert Blum, Rockville Centre, N.Y.

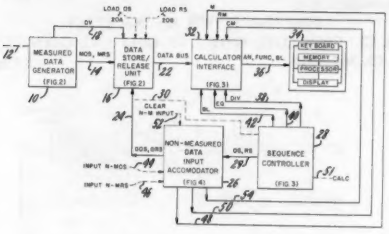
Filed Sep. 7, 1978, Ser. No. 940,324
Int. Cl.³ G03B *27/32*
U.S. Cl. 364—560 **15 Claims**

9. A system for determining the ratio of values of original size data to reproduction size data in the graphic arts, either of said values being measured data or one value being measured data and the other non-measured data, comprising:

(a) calculator means having an arithmetic processor, a keyboard for entry in said calculator means of non-measured data signals of a first type indicative of values of said original size or signals of a second type indicative of values of said reproduction size, and memory means for releasable storage of non-measured data signals entered in said calculator means and indicative of the values of said non-measured data;

(b) means for measuring data of said first and second types and for generating first and second measured data signals respectively indicative of values thereof; and

(c) control means connected to said calculator means and to said means (b)



(1) operative in first mode for conducting said first and second measured data signals successively to said processor for arithmetic computation therebetween; or

(2) operative in second mode on presence of such keyboard-entered non-measured data signals for transferring the same to said memory means and conducting to said processor for computation either (A) said first measured data signals and then such memory-stored signals or (B) such memory-stored signals and then said second measured data signals in accordance with the respective types of said non-measured data signals.

4,250,555

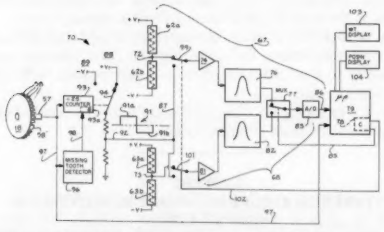
SELF-CALIBRATING DATA COLLECTION SYSTEM FOR DYNAMIC WHEEL BALANCING MACHINE

Richard A. Mitchell, Milpitas; Hoyt H. Nelson, Santa Clara, and Donald R. Sherman, San Jose, all of Calif., assignors to Nortron Corporation, Sunnyvale, Calif.

Filed Jan. 22, 1979, Ser. No. 5,040

Int. Cl.[3] **G01M** *1/00*; **G06F** *15/20*

U.S. Cl. 364—571 **7 Claims**



1. In a wheel balancing machine of a type having means for mounting a wheel to be rotated and means for sensing unbalanced forces acting upon the wheel during rotation thereof, a self-calibrating information sensing system comprising means for generating a first signal at a frequency substantially corresponding to the rate of rotation of the mounted wheel and at a predetermined amplitude, means for generating a second signal at a frequency substantially corresponding to the rate of rotation of the mounted wheel and at an amplitude responsive to the degree of unbalanced forces acting upon the wheel, information processing means for receiving said first and second signals via a predetermined channel for comparing the value of characteristics of said first signals received to their expected values to determine a correction factor for adjusting the characteristics of said second signals received via said channel to cause them to have their related corrected values.

4,250,556

ELECTRONIC CONTROL SYSTEM FOR ANALOG CIRCUITS

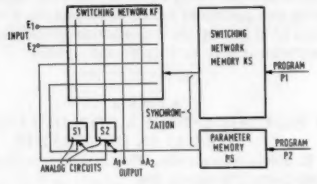
Karl Goser, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 6, 1979, Ser. No. 10,121

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1978, 2805940

Int. Cl.[3] **G06J** *1/00*; **G06G** *7/06*

U.S. Cl. 364—600 **7 Claims**



7. An electronic control system for analog circuits, comprising:

a switching network including switching crosspoints;

a plurality of controllable analog circuits connected to said switching network;

a switching network memory storing a switching program and operable to control said crosspoints;

parameter means connected to and operable to adjust the operating parameters of the individual analog circuits, including a parameter memory storing a parameter program;

synchronization means connected to said memories for controlling synchronous operation thereof; and

at least one delay line connected to at least one line of said switching network and connected to and controlled by said synchronization means.

4,250,557

INTEGRATOR HAVING DROP-OUT CIRCUIT

Max Gaertner, Warminster, Pa., assignor to Fischer & Porter Company, Warminster, Pa.

Filed Jun. 20, 1979, Ser. No. 50,324

Int. Cl.[3] **G06J** *1/00*

U.S. Cl. 364—605 **8 Claims**

1. An integrator for totalizing with respect to time an input signal representing a process variable being metered, to provide a total reading for a given time interval, the integrator having a drop-out capability functioning to reduce to zero the data fed into a totalizer when the input signal falls below a predetermined level at which it no longer accurately reflects the variable; said integrator comprising:

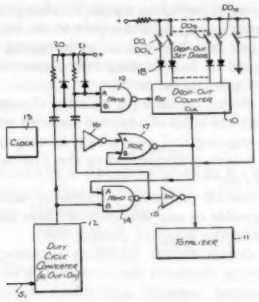
A. a duty-cycle converter responsive to the input signal to periodically generate a rectangular wave whose ON period has a duration which is a function of the input signal level—the higher the signal level, the shorter the resultant OFF period in the cycle; the longer the OFF period duration, the lower the input signal level;

B. a clock generating clock pulses at a constant frequency which is high relative to the duty cycle frequency;

C. means normally to supply pulses derived from the clock to said totalizer during the ON period of each duty cycle to provide a total reading of the input signal for a given time interval;

D. a settable drop-out counter adapted to carry out a test procedure by counting pulses derived from the clock during the OFF period of each cycle and to yield an inhibiting bias only when the count accumulated therein reflects an OFF period duration which exceeds the selected setting therefor;

E. means responsive to said inhibiting bias to interrupt the supply of clock pulses to said totalizer during the succeeding ON period, whereby the totalizer functions to count pulses whose number depends on the input signal only when this signal is above said predetermined level;



F. means to reset said counter at the beginning of each duty cycle OFF period, whereby the counter continuously repeats the drop-out test procedure; and

G. means to reset said counter continuously during the ON period to keep the counter from reaching the drop-out count after the beginning of the ON period.

4,250,558

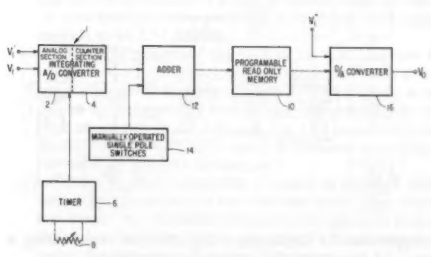
HYBRID ANALOG FUNCTION GENERATOR

Marion A. Keyes, IV, Chagrin Falls; Jack W. Malcolm, Louisville, and William L. Thompson, Chardon, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Jan. 29, 1976, Ser. No. 7,078

Int. Cl.³ G06J *1/00*

U.S. Cl. 364—607 **5 Claims**



1. An analog function generator for producing an analog output signal varying in predetermined non-linear relationship to an analog input signal, comprising in combination, an A/D converter receiving said analog input signal generating a first digital signal proportional to said analog input signal, an adder receiving said first digital signal and an adjustable digital signal producing a second digital signal equal to the algebraic sum of said first digital signal and said adjustable digital signal, a PROM receiving said digital signal as an address programmed to generate a third digital signal varying in non-linear relationship with said second digital signal and a D/A converter receiving said third digital signal generating an analog output signal proportional to said third digital signal whereby said analog output signal varies in said predetermined non-linear relationship to said analog input signal.

4,250,559

COORDINATE CONVERTER FOR CHANGING POLAR VECTOR VARIABLE INTO CARTESIAN VECTOR VARIABLES

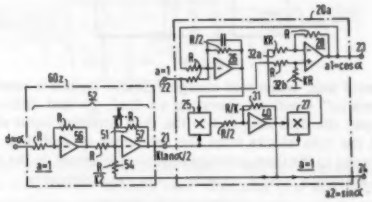
Felix Blaschke, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 4, 1979, Ser. No. 27,152

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1978, 2816614

Int. Cl.³ G06G *7/22*

U.S. Cl. 364—815 **16 Claims**



1. A coordinate converter for changing first and second given variables corresponding to the angle and the magnitude coordinates, respectively, of a vector defined in polar coordinates, into third and fourth variables, corresponding to the Cartesian coordinates of the vector, comprising:

first and second multipliers, an adder and a subtraction element in which

the first variable is fed to the first input of the first multiplier and the output variable of the adder is fed to the second input of the first multiplier;

the adder is addressed by the second variable and the output variable of the subtraction element;

the output variable of the first multiplier is taken off as the fourth variable and is also fed to one input of the second multiplier;

the other input of the second multiplier is addressed by the first variable;

the second variable is additively fed to the subtraction element and the output variable of the second multiplier is fed to it subtractively; and

the output variable of the subtraction element is taken off as the third variable.

4,250,560

TEXT PROCESSING APPARATUS

Jürgen Dethloff, Elbchaussee 239, 2000 Hamburg 52, Fed. Rep. of Germany, and Hans-Peter Heyden, Pinneberg, Fed. Rep. of Germany, assignors to Jürgen Dethloff, Fed. Rep. of Germany

Filed Jun. 13, 1978, Ser. No. 915,245

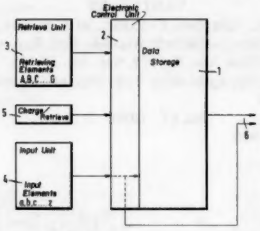
Claims priority, application Fed. Rep. of Germany, Jan. 16, 1978, 2801707

Int. Cl.³ G06F *1/00*; B41J *5/30*

U.S. Cl. 364—900 **31 Claims**

1. In a text processing apparatus including a data storage having an input and an output and operable to receive information sequences, as variably-sized data blocks, and which data blocks can be retrieved, to form a total information, in the form of a total text, by operation combination, an electronic control unit connected to the data storage, a charge/retrieve switch connected to said electronic control unit and operable from a "retrieve" position to a "charge" position and back; an input device connected to said electronic control unit and comprising input elements; and a retrieving device connected to said electronic control unit and comprising said retrieving elements; said electronic control unit, when said charge/retrieve

switch is set to the "charge" position, assigning, to each actuated retrieving element during actuation thereof, a sub-range of said data storage with a storage capacity corresponding to at least the amount of data assigned to said data storage by actuation of the corresponding input elements, and said electronic



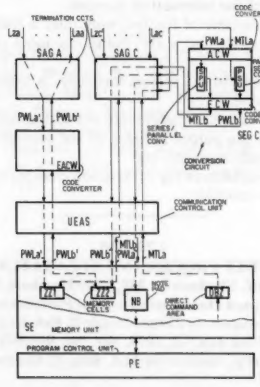
control unit, when said charge/retrieve switch is reset to the "retrieve" position, operating to feed, to said data storage output, the data assigned to the then actuated input elements and the data blocks from the subranges of said data storage assigned to the then actuated retrieving element, in the order of the actuation of said retrieving and input elements.

4,250,561

APPARATUS FOR RECEIVING AND/OR DELIVERING SIGNALLING CHARACTERS EACH HAVING A PLURALITY OF POLARITY CHANGES

Friedrich Papendieck; Guenther Kerschner; Rolf-Peter Verfuerth, and Jüergen Rabold, all of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 26, 1978, Ser. No. 972,653
Int. Cl.³ G06F *5/04, 3/00*
U.S. Cl. 364—900 **1 Claim**



1. In a circuit arrangement for accepting and/or delivering signaling characters each of which are constituted by a plurality of polarity changes, the circuit arrangement being of the type in which at least one termination circuit accepts and/or delivers signals in the form of polarity changes in a program-controlled data switching system and in which a memory unit which includes a plurality of memory cells is provided and controlled by a program control unit, and incoming and outgoing lines connected to the termination circuit, in combination therewith the improvement comprising:

said memory cells individually assigned to said incoming and outgoing lines;

a conversion circuit connected to the memory unit for receiving polarity changes from said memory cells and emitting polarity changes to said memory cells and for converting parallel character data into polarity changes and polarity changes into parallel character data;

a further termination circuit and a plurality of incoming and outgoing lines connected thereto and operating as an interface between the first-mentioned termination circuit and said conversion circuit;

the memory unit further including first and second memory areas;

said conversion circuit including a polarity change input for receiving polarity changes connectible to the output of a first memory cell which serves as an incoming cell and which is assigned to an incoming line connected to the first-mentioned termination circuit;

said conversion circuit including a polarity change output connectible with the input of a second memory cell which serves as an outgoing cell and which is assigned to an outgoing line which is connected to the first-mentioned termination circuit;

said conversion circuit including a character data output which is connectible to said first memory area and which is interrogated by the program control unit;

said conversion circuit further including a character data input for receiving character data connectible to the output of said second memory area which is selectively loaded by said program control unit; and

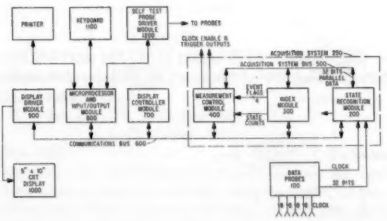
said conversion circuit further including a first code converter, a second code converter, and a chain of serial/parallel and parallel/serial converters connected between said first and second code converters for respectively converting pulse changes into parallel data and parallel data into pulse changes.

4,250,562

DIGITAL SIGNAL STATE ANALYZER AND DISPLAY

George A. Haag, Colorado Springs; Douglas Fogg, Loveland; Gordon A. Greenley; Steve A. Shepard, both of Colorado Springs, all of Colo., and F. Duncan Terry, Meridan, Ill., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 828,138, Aug. 29, 1977, abandoned. This application May 22, 1979, Ser. No. 41,361
Int. Cl.³ G06F *3/05, 3/153*
U.S. Cl. 364—900 **4 Claims**



1. Apparatus for displaying a digital signal representing a sequence of data states, the apparatus comprising:

input means coupled to receive the digital signal for producing output signals representative of the data states of the digital signal received thereby;

qualifier means coupled to receive the output signals from said input means for producing an output signal in response to a data state received thereby attaining a selected qualifying state condition;

selection means coupled to said qualifier means for providing a signal representative of the qualifying state condition;

storage means having a first input coupled to receive the output signals from said input means and having a second input for receiving the output signal from said qualifier

means for storing signals representative of the signals appearing on the first input in response to a signal appearing on the second input;

format control means for receiving signals representative of selectable assignments of sets of contiguous bits of each data state to logical fields, representative of a selected concatenation of the logical fields, and representative of radicies selected for the respective logical fields for producing therefrom an output indicative of the signals received thereby;

converter means coupled to said storage means for producing a formated signal representing the stored signals of said storage means formatted in response to the output of said format control means; and

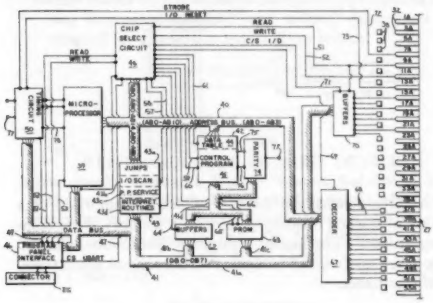
display means for providing a visual display of the formatted signal.

4,250,563

EXPANDABLE PROGRAMMABLE CONTROLLER

Odo J. Struger, Chagrin Falls, Ohio, assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Aug. 9, 1979, Ser. No. 65,119
Int. Cl.³ G06F *9/06*
U.S. Cl. 364—900 **7 Claims**



1. An expandable programmable controller comprising:

a rack forming an I/O slot and a lead slot, and having an I/O back edge connector disposed in the I/O slot and universal back edge connection means disposed in the lead slot and electrically coupled to the I/O back edge connector for connecting either a processor module or a rack adapter module to an I/O module;

an I/O interface module disposed in the I/O slot, the I/O interface module including a circuit board with a front edge adapted to be connected to I/O devices on a controlled system and with a back edge connected to the back edge connector in the I/O slot, the I/O interface module having circuits with logic states determined according to the status of the I/O devices; and

a processor module removably disposed in the rack with a back edge connected to the universal back edge connection means, the processor module being operable to monitor and control the circuits in the I/O interface module under the direction of a control program.

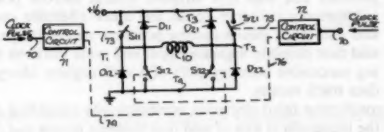
4,250,564

MAGNETIC BUBBLE DRIVING DEVICE

Kousuke Takahashi, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Sep. 7, 1979, Ser. No. 73,365
Claims priority, application Japan, Sep. 12, 1978, 53-112781
Int. Cl.³ G11C *19/08*
U.S. Cl. 365—6 **10 Claims**

1. In a magnetic bubble driving device of the type which includes driving circuits, each having a driving coil wound around a bubble memory unit for producing a rotating magnetic field to the memory unit and a pulse generator for controlling the operation of said driving circuits so that they produce periodic coil currents whose phases are different, said pulse generator being operable to produce periodic pulse signals, at least one of said driving circuits comprising a first switch and a first clamping diode connected in parallel between a first drive coil terminal and a first voltage source terminal, a second switch and a second clamping diode connected in parallel between a second drive coil terminal and said first voltage source terminal, a third switch and a third clamping diode connected in parallel between said first drive coil terminal and a second voltage source terminal and a fourth switch and a fourth clamping diode connected in parallel between said second drive coil terminal and said second voltage source terminal, the combination of a first control circuit



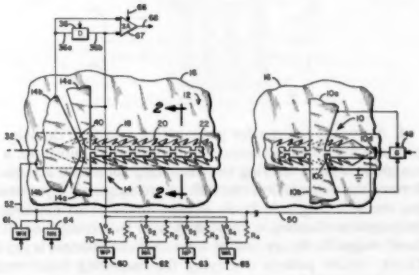
connected to receive the pulse signals and to operate said switches in response thereto, such that said first and fourth switches are both closed for a first duration during which a coil current flows from said first to said second drive coil terminal and such that one of said first and fourth switches is opened at the end of said first duration and the other switch is opened at a finite time thereafter; and a second control circuit also connected to receive said pulse signals and to operate said switches in response thereto, such that said second and third switches are both closed for a second duration during which a coil current flows from said second to said first drive coil terminal and such that one of said second and third switches is opened at the end of said second duration and the other switch is opened at a finite time thereafter, whereby a coil current having a trapezoidal waveshape is produced.

4,250,565

SYMMETRICAL MEMORY PLANE FOR CROSS-TIE WALL MEMORY SYSTEM

Gregory J. Cosimini, St. Paul; Leslie H. Johnson, Minneapolis; David S. Lo, Burnsville; George F. Nelson, Coon Rapids; Maynard C. Paul, Bloomington, and Ernest F. Torok, Minneapolis, all of Minn., assignors to Sperry Corporation, New York, N.Y.

Filed Feb. 23, 1979, Ser. No. 20,762
Int. Cl.³ G11C *11/00*
U.S. Cl. 365—87 **10 Claims**



1. A cross-tie wall memory system in which Bloch-line, cross-tie pairs are propagated downstream along a shift register formed of successive memory cells, comprising:

magnetic data track means symmetrically formed about its longitudinal axis;

electrically-conductive wide-narrow-edged first stripline means for forming successive wide, narrow portions therealong;

said first stripline means including at its upstream end conductive first and second electrodes that are a part of and that extend substantially transversely away from one of said first stripline means wide portions, said first stripline means symmetrically formed about its longitudinal axis;

said first stripline means and said data track means arranged with their longitudinal axes parallelly superposed;

said data track means having two opposing edges formed into repetitive patterns of successive narrow portions that form wide portions therebetween;

said first stripline means wide portions substantially centered about alternate ones of said data track means narrow portions and said first stripline means narrow portions substantially centered about the other alternate ones of said data track means narrow portions, successive pairs of said first stripline means narrow and wide portions forming successive memory cells of a shift register along said data track means;

a conductive third electrode symmetrically extending along the longitudinal axis of said first stripline means and forming a narrow portion, immediately upstream of said first and second electrodes, that is centered substantially about the upstream one of said data track means narrow portions for forming a generator segment thereat; and,

drive current generator means coupled across said first and second electrodes and said third electrode and directing a generate current drive signal across said generator segment for generating a cross-tie in said generator segment.

4,250,566

MAGNETIC DOMAIN PROPAGATION REGISTER

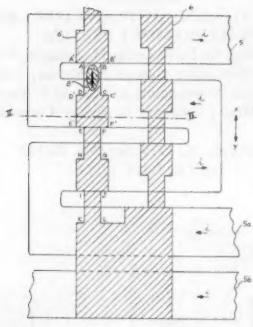
Claude Battarel, Magagnosc, France, assignor to Crouzet, Paris, France

Filed Oct. 4, 1978, Ser. No. 948,417

Claims priority, application France, Oct. 12, 1977, 77 30804

Int. Cl.³ G11C *19/08*

U.S. Cl. 365—88 **3 Claims**



1. A storage register for propagating magnetic domains in a propagation channel comprising an insulating substrate, a soft magnetic layer overlying the insulating substrate, in which is formed the propagation channel, a hard magnetic layer overlying the soft magnetic layer, except in the areas defining the propagation channel, an insulating layer overlying the soft and hard magnetic layers and at least one conduction layer in a Greek border pattern overlying the insulating layer, constituted by parallel segments perpendicular to the propagation channel, the propagation channel comprising widened boxes, characterized in that the widened boxes of the propagation channel are located at the intersections of the propagation channel with the segments of the conduction layer;

wherein the widened boxes of the propagation channel are substantially in the form of a rectangle of which one of the sides parallel to the segments of the conduction layer is disposed along the downstream edge, with respect to the direction of propagation of the domains, of one of said segments, the length of the sides of the rectangle perpendicular to these segments being shorter than the width of the segments in question.

4,250,567

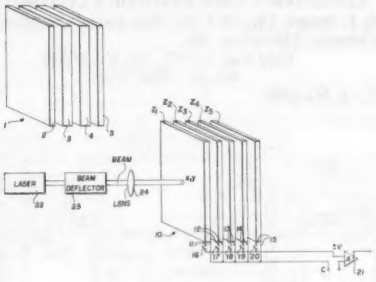
PHOTOVOLTAIC-FERROELECTRIC BEAM ACCESSED MEMORY

Philip S. Brody, Brookmont, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 20, 1979, Ser. No. 50,365

Int. Cl.³ G11C *13/08, 11/22*

U.S. Cl. 365—109 **15 Claims**



1. A three-dimensional memory which is comprised of a plurality of stacked memory planes, each memory plane comprising at least a continuous transparent photovoltaic-ferroelectric layer sandwiched between two continuous plane transparent electrodes.

4,250,568

CAPACITOR SEMICONDUCTOR STORAGE CIRCUIT

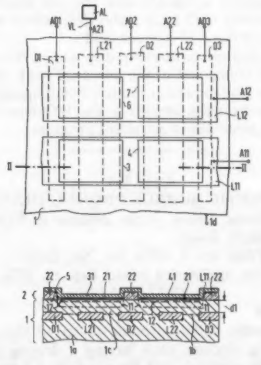
Gerhard Grassl, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 28, 1979, Ser. No. 98,123

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1978, 2855079

Int. Cl.³ G11C *11/24*

U.S. Cl. 365—149 **4 Claims**



1. A semiconductor storage circuit comprising:

a doped semiconductor body comprising a plurality of storage cells arranged in columns and rows, each of said cells including a storage capacitor;

for each row, a common first drive line, and, for each column, a common second drive line;

an insulating layer carried on said semiconductor body;

each of said first drive lines comprising a strip-like electrically conductive layer carried on said insulating layer;

each of said second drive lines comprising buried lines extending within said semiconductor body and doped opposite thereto;

said drive lines extending in different directions so as to intersect each other and define intersection zones;

said insulating layer including first portions within said intersection zones which are thinner than the remainder of said insulating layer so that in said intersection zones insulating layer capacitors are formed which possess outer electrodes composed of portions of said first drive lines and constitute said storage capacitors of said storage elements;

the width of said buried second drive lines being less than the dimensions, oriented transversely to said second drive lines, of said outer electrodes; and

further buried lines in said semiconductor body spaced apart and interposed between said second drive lines and adapted for connection to a voltage source.

4,250,569

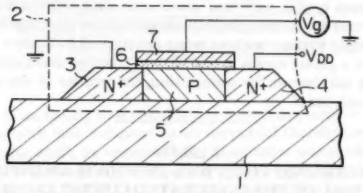
SEMICONDUCTOR MEMORY DEVICE

Nobuo Sasaki, Kawasaki; Moto'o Nakano, Yokohama; Yasuo Kobayashi, and Takashi Iwai, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Tokyo, Japan

Filed Nov. 15, 1978, Ser. No. 960,917

Int. Cl.[3] G11C *11/40*

U.S. Cl. 365—185 **19 Claims**



1. A semiconductor memory device comprising semiconductor memory elements, each said memory element having a gate threshold voltage for electrical conductance of said element that is a function of the information stored in said element, each said semiconductor memory element comprising a semiconductor region having one type of conductivity and being floating electrically, a source region and a drain region located adjacent to said semiconductor region and separated by said semiconductor region and both having the opposite type of conductivity with respect to said semiconductor region, each of said source and drain regions being connected to a respective electrode, a gate electrode over the surface of and insulated from said semiconductor region, means for writing information into a selected one of said elements by injecting charges into the respective one of said semiconductor regions and means for reading said stored information by detecting a variation of said electrical conductance of said selected element, said writing and reading means comprising means for applying selected potentials to said three electrodes of each said memory element.

4,250,570

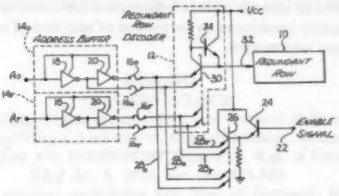
REDUNDANT MEMORY CIRCUIT

Frederick Tsang, Saratoga; Gregory A. Kannal, Mountain View, and Marcian E. Hoff, Jr., Sunnyvale, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 705,597, Jul. 15, 1976, abandoned. This application Jan. 9, 1978, Ser. No. 867,779

Int. Cl.[3] G11C *11/40*

U.S. Cl. 365—200 **12 Claims**



1. A redundant memory circuit for a memory array comprising:

a memory having a preselected number of rows and columns having addresses associated therewith, each of said rows and columns having an individual decoder coupled thereto, and one or more redundant rows or columns having initially unspecified addresses associated therewith, each of said redundant rows or columns having an individual redundant decoder coupled thereto;

programming means for causing the redundant decoders coupled to said redundant rows or columns having initially unspecified addresses to respond only to the addresses of defective rows or columns having addresses associated therewith; and

means for disabling said defective rows or columns having addresses associated therewith.

4,250,571

PORTABLE ELECTRONIC DEVICE

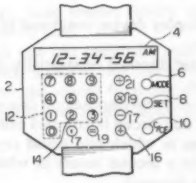
Heihachiro Ebihara, Tokorozawa; Fukuo Sekiya, Tokorozawa, and Takashi Yamada, Sayama, all of Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Mar. 13, 1978, Ser. No. 885,732

Claims priority, application Japan, Mar. 15, 1977, 52/27593

Int. Cl.[3] G04B *47/00*; G04C *9/00*; G06F *7/38*

U.S. Cl. 368—10 **4 Claims**



1. In a portable electronic device having time-keeping circuit means for providing at least units of seconds and tens of seconds of time information, and display means for displaying said time information in digital form, the improvement comprising: a plurality of first external control members for inputting numeric data signals;

a control circuit for selecting at least said tens of seconds of time information for correction;

a second external control member for inputting control signals to actuate said control circuit;

first gate means for applying said numeric data signals to said timekeeping circuit means to effect correction of at least said tens of seconds of time information;

second gate means for automatically resetting said units of seconds of time information to zero in response to correction of said tens of seconds of time information;

said units of seconds of time information being incremented once per second by said timekeeping circuit means, said incrementing commencing immediately subsequent to said automatic resetting to zero of said units of seconds by said second gate means; and

circuit means for automatically shifting to selection of the units of seconds of time information for correction, immediately subsequent to correction of said tens of seconds of time information.

4,250,572

WATCH MODULE CONSTRUCTION

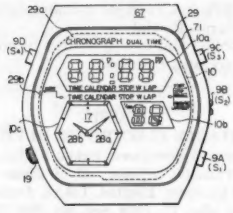
Masaru Yoshida, Tokyo, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Filed Sep. 18, 1979, Ser. No. 76,697

Claims priority, application Japan, Sep. 22, 1978, 53-116840

Int. Cl.[3] **G04B** *19/24;* **G04C** *19/00;* **G04E** *13/06;* **G04F** *8/00*

U.S. Cl. 368—71 **4 Claims**



1. A watch module construction for an electronic timepiece powered by a battery, comprising:

a digital display device composed of a liquid crystal display cell;

an analog display device composed of time indicating hands;

a base plate;

a circuit board disposed substantially on the same plane as said base plate;

a cell support frame disposed on one side of each of said base plate and said circuit board, said cell support frame having a first recess in which said liquid crystal display cell is disposed, and a second recess in which said time indicating hands are disposed;

an IC chip mounted on the other side of said circuit board in substantially axial alignment with said display cell;

a wheel train bridge mounted on the other side of said base plate to provide an axial space between said wheel train bridge and the other side of said base plate at an area substantially in axial alignment with said time indicating hands;

a wheel train mechanism disposed in said axial space between said wheel train bridge and said base plate; and

a single lamp disposed at a substantially central portion of said watch module construction in the vicinity of an outer periphery of said liquid crystal display cell and an outer periphery of said analog display device to simultaneously illuminate both of said liquid crystal display cell and said analog display cell.

4,250,573

DIGITAL ALARM WRISTWATCH

Toshiaki Saito, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

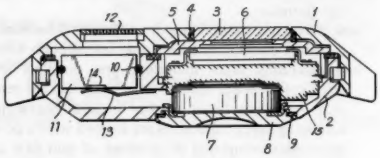
Continuation of Ser. No. 796,102, May 12, 1977, abandoned.

This application Dec. 6, 1978, Ser. No. 967,034

Claims priority, application Japan, May 12, 1976, 51-59655[U]

Int. Cl.[3] **G04C** *21/16;* **G04B** *37/00;* **G08B** *3/00*

U.S. Cl. 368—73 **4 Claims**



1. An electronic alarm wristwatch case for supporting an alarm buzzer and digital display therein, comprising:

a watch case having a front display surface and an interior, said display surface formed with at least one display opening and alarm buzzer opening on said display side and said interior formed with a first chamber for receiving time display means in registration with said display opening and a second chamber for receiving alarm buzzer means in registration with said buzzer opening, said first chamber and said second chamber in non-overlapping relation in plan view, said chambers openly communicating with each other on the back side of said wristwatch away from said buzzer cover opening for providing electrical connection between said first chamber and the alarm buzzer means in the second chamber;

time display means disposed within said watch case in said first chamber for viewing through said display opening; and

alarm buzzer means disposed within said second chamber so that said alarm buzzer means does not overlap said display means in plan view and sound emanating from said alarm buzzer means escapes through said buzzer openings in said display surface without being interrupted by a users wrist and a gasket means in said second chamber and surrounding said buzzer for watersealing the interior of the wristwatch case.

4,250,574

ELECTRONIC TIMEPIECE IN WHICH AN INPUT TERMINAL OF THE INTEGRATED CIRCUIT IS USED AS AN OUTPUT TERMINAL

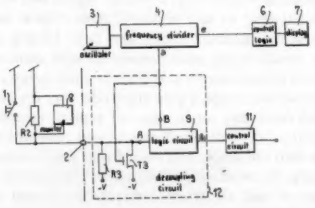
Claude Mutrux, Marin, Switzerland, assignor to Ebauches Electroniques SA, Marin, Switzerland

Filed Nov. 7, 1978, Ser. No. 958,435

Claims priority, application Switzerland, Nov. 11, 1977, 13785/77

Int. Cl.[3] **G04B** *17/12*

U.S. Cl. 368—184 **8 Claims**



1. An electronic timepiece capable of performing different functions and having a means for supplying electrical power,

an integrated circuit including an oscillator connected to a frequency divider for supplying various output signals for controlling a display means, comprising:

a control circuit for controlling the different functions of the timepiece in response to a logic signal;

said integrated circuit having at least one terminal for receiving a control input signal;

control means connected to said integrated circuit terminal for generating said control input signal; and

a decoupling circuit connected to said integrated circuit terminal, said control circuit, and said frequency divider, said decoupling circuit being responsive to said control input signal for delivering at an output said logic signal to said control circuit;

said decoupling circuit further including means for receiving a measurement output signal produced by said frequency divider for measurement purposes and delivering said measurement output signal to said integrated circuit terminal, said receiving and delivering means precluding said measurement output signal from appearing at said logic signal output of said decoupling circuit, whereby said integrated circuit terminal may be used to control a timepiece function and also may be used for measurement of timepiece signals without interfering with timepiece operation.

4,250,575

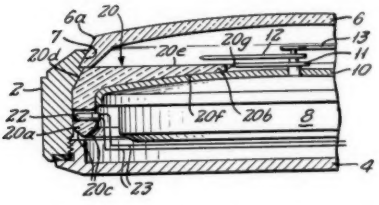
ILLUMINATOR FOR ANALOG TIMEPIECE DIAL

Paul Flumm, Oakville, Conn., assignor to Timex Corporation, Middlebury, Conn.

Filed Jul. 11, 1979, Ser. No. 56,561

Int. Cl.³ G04B *19/30*

U.S. Cl. 368—227 **15 Claims**



1. In an analog timepiece having a crystal spaced in front of a dial with time indicator hands supported therebetween on a rotatable shaft, an improved dial illuminator comprising:

(a) a substantially transparent, light-transmitting dial cap diposed behind the crystal, said dial cap having a tubular section disposed around the periphery of the dial and extending axially therebehind with portions thereof behind the dial defining a recess, and an annular rim section projecting from the tubular section over the dial toward its center, said rim section having a light-reflecting outer peripheral surface for reflecting light from the tubular section into the rim section and over the dial and an inner peripheral surface which defines an aperture through which the shaft supporting the time indicator hands passes; and

(b) a light source disposed behind the dial in the recess in the tubular section of said dial cap, whereby light from said light source is directed from behind the dial and around its periphery by the tubular section of said dial cap and uniformly over the dial toward its center by said rim section.

4,250,576

ELECTRIC CLOCK

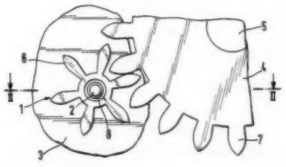
Roland Sudler, Frankfurt am Main, and Norbert Reiferscheid, Camberg-Würges, both of Fed. Rep. of Germany, assignors to Quarz-Zeit AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 5, 1978, Ser. No. 921,963

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1977, 2732047

Int. Cl.³ G04B *29/00*

U.S. Cl. 368—323 **9 Claims**



1. An electric clock, particularly a quartz-crystal clock, having a motion work which is driven by an electric motor having a shaft, comprising

a pinion including teeth made of an elastic material being seated on the shaft of the motor,

an input gear of the motion work, said input gear having teeth meshing with the teeth of said pinion,

said pinion including said teeth thereof is made of a soft-elastic material, said pinion is formed directly radially adjacent a base of said teeth thereof with a peripheral wall defining a concentric recess for the free passage of the shaft therein and said pinion is formed with an axial shoulder, constituting an inner end of said concentric recess, having a concentric hole therein fixedly receiving the shaft in said concentric hole,

said base of said teeth and said peripheral wall of said concentric recess radially adjacent said base of said teeth are free, non-abutted by and spaced from said shaft, and

said input gear including said teeth thereof is made of an elastic material.

DESIGN PATENTS

GRANTED FEB. 10, 1981

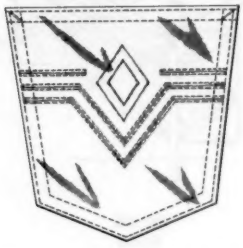
ERRATA

For CLASS	See PATENT NO.
D18–007	258,221
D21–020	258,244

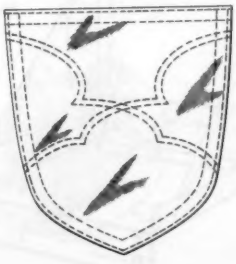
DESIGNS

FEBRUARY 10, 1981

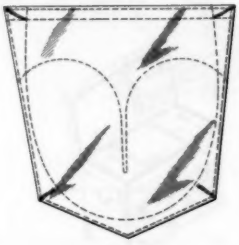
258,170
POCKET FOR JEANS OR THE LIKE
Martin Heinfling, Bayside, N.Y., assignor to Englishtown Sportswear Ltd., New York, N.Y.
Filed May 16, 1979, Ser. No. 39,541
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—25



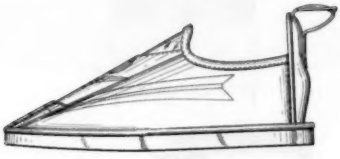
258,171
POCKET FOR JEANS OR THE LIKE
Martin Heinfling, Bayside, N.Y., assignor to Englishtown Sportswear Ltd., New York, N.Y.
Filed May 16, 1979, Ser. No. 39,542
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—25



258,172
POCKET FOR JEANS OR THE LIKE
Martin Heinfling, Bayside, N.Y., assignor to Englishtown Sportswear Ltd., New York, N.Y.
Filed Jun. 13, 1979, Ser. No. 48,204
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—25

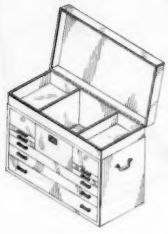


258,173
SIMULATIVE SPORTS SHOE
William J. Cohen, Braintree, Mass., assignor to CITC Industries Inc., New York, N.Y.
Filed Jul. 17, 1978, Ser. No. 925,621
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—279

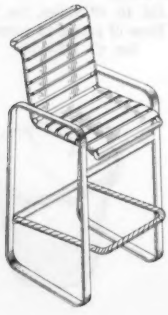


258,174
UNIFORM THIMBLE
William B. Shane, and Claudia A. Shane, both of 2845 N. Albany, Chicago, Ill. 60618
Filed Jul. 16, 1979, Ser. No. 57,578
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D3—29

258,175
TOOL CHEST, OR SIMILAR ARTICLE
Richard C. Hazeltine, 5407 S. Nottingham, Chicago, Ill. 60638
Filed Aug. 10, 1978, Ser. No. 932,681
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—74

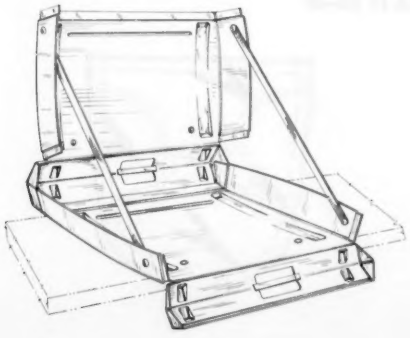


258,176
BAR STOOL
Bertrand M. Baker, 109 N. Warbler La., Sarasota, Fla. 33577
Filed Feb. 22, 1978, Ser. No. 880,316
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—35



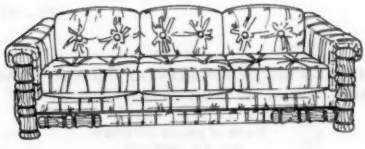
258,177
BAR
Bertrand M. Baker, 109 N. Warbler La., Sarasota, Fla. 33577
Filed Feb. 22, 1978, Ser. No. 880,307
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—144

258,178
COMBINATION STADIUM SEAT, CUSHION AND CAPE CARRYING CASE
Vinton A. Bayne, 2710 15th St., Boulder, Colo. 80302
Continuation of Ser. No. 768,554, Feb. 14, 1977, and a continuation of Ser. No. 768,555, Feb. 14, 1977. This application Oct. 10, 1978, Ser. No. 949,790
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—47

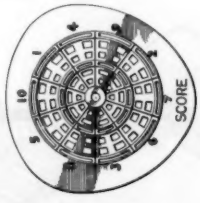


258,179
ROCKING CHAIR
Bertrand M. Baker, 109 N. Warbler La., Sarasota, Fla. 33577
Filed Feb. 22, 1978, Ser. No. 880,311
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—49

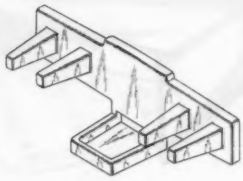
258,180
SEAT
Stapleton Long, Morristown, Tenn., assignor to The Berkline Corporation, Morristown, Tenn.
Filed May 30, 1978, Ser. No. 910,837
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—62



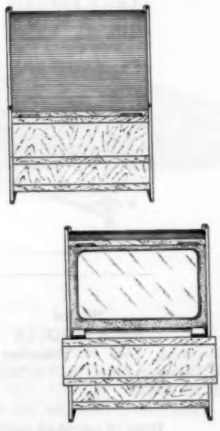
258,181
URINAL SCREEN
John M. Adam, 2404 Powers Ferry Rd., Atlanta, Ga. 30062
Continuation-in-part of Ser. No. 950,583, Oct. 12, 1978, which is a continuation-in-part of Ser. No. 852,937, Nov. 18, 1977. This application Mar. 9, 1979, Ser. No. 18,867
Term of patent 14 years
Int. Cl. D23—*01*; D6—*06*
U.S. Cl. D6—86

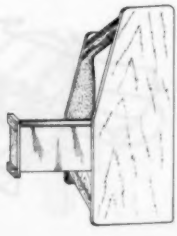


258,182
COMBINED TENNIS RACKET HOLDER AND SHELF
David Thorne, Tarzana, Calif., assignor to CMT Development Corporation, Northridge, Calif.
Filed May 5, 1977, Ser. No. 794,031
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—125



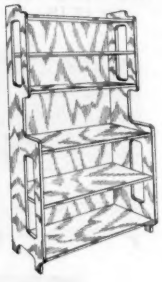
258,183
PROJECTION TELEVISION RECEIVER CABINET
Earl W. Muntz, 3416 Alana Dr., Sherman Oaks, Calif. 91403
Continuation-in-part of Ser. No. 741,223, Nov. 19, 1976, abandoned. This application Jul. 24, 1978, Ser. No. 927,683
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—150



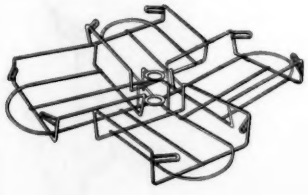


258,184
DESK
George Nelson, 34 Gramercy Pk., New York, N.Y. 10003
Filed May 17, 1978, Ser. No. 907,061
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177

258,185
ETAGERE
Henry P. Glass, 245 Dickens Rd., Northfield, Ill. 60093
Filed Sep. 21, 1978, Ser. No. 944,242
Term of patent 3½ years
Int. Cl. D06—*04*
U.S. Cl. D6—186

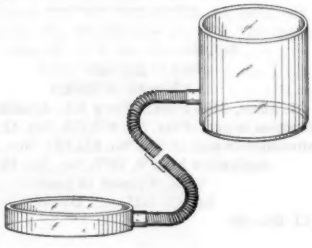


258,186
RACK MODULE
Marvin Glassenberg, 6857 N. Francisco Ave., Chicago, Ill. 60645, and Theodore Zidek, 9127 S. Sacramento Ave., Evergreen Park, Ill. 60642
Filed Dec. 7, 1979, Ser. No. 101,217
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191

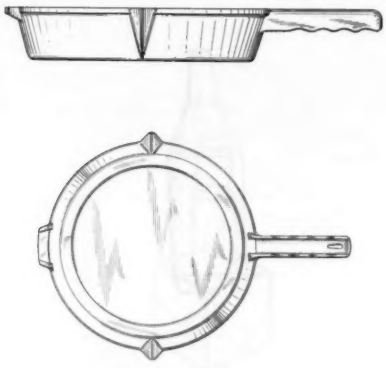


258,187
PORTABLE CHAIR INSERT FOR BACK SUPPORT
Alan Robbins, 41 Bonnybrook Rd., Waban, Mass. 02168
Filed Apr. 4, 1979, Ser. No. 27,045
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D6—201

258,188
COMBINED BEVERAGE CONTAINER AND COASTER
Michael C. Wilson, 164 Carleton, Glen Ellyn, Ill. 60137
Filed Aug. 11, 1978, Ser. No. 932,870
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—3

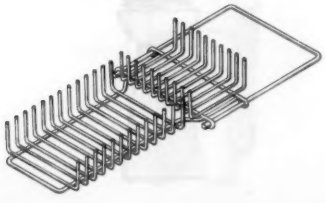


258,189
SKILLET
William H. Miller, Sidney, Ohio, assignor to General Housewares Corp., Stamford, Conn.
Filed Apr. 18, 1979, Ser. No. 31,064
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—64

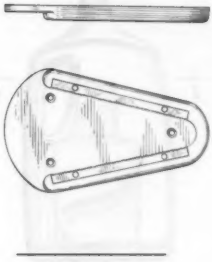


258,190
DINNER KNIFE
John C. Mohr, New York, N.Y., assignor to H. E. Lauffer Co., Inc.
Filed May 3, 1979, Ser. No. 35,624
Term of patent 7 years
Int. Cl. D07—*03*
U.S. Cl. D7—151

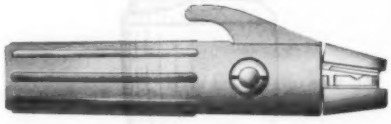
258,191
DISH DRYING RACK
Bernard S. Berman; Bernard L. Schlossberg, and Maurice Kaye, all of P.O. Box 902, Hicksville, N.Y. 11802
Filed Mar. 13, 1978, Ser. No. 885,785
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—188



258,192
JAR OPENER
Robert W. Maloney, 4061 Wabash Ave., San Diego, Calif. 92104
Filed Dec. 11, 1978, Ser. No. 968,543
Term of patent 14 years
Int. Cl. D07—*99, 06*
U.S. Cl. D8—18

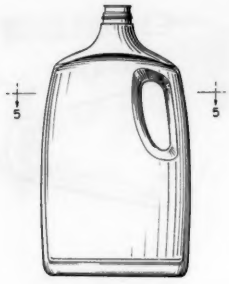


258,193
AIR-CARBON ARC CUTTING AND GOUGING TORCH
Stephen A. Hoffman, Lancaster, Ohio, assignor to Arcair Company
Filed Feb. 13, 1978, Ser. No. 877,149
Term of patent 14 years
Int. Cl. D08—*05*
U.S. Cl. D8—30

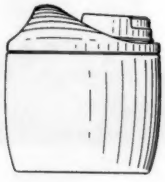


258,194
CONNECTOR FOR STRUCTURAL SUPPORTS
William J. Stanley, 2030 N. Orleans, Chicago, Ill. 60614
Filed Sep. 15, 1978, Ser. No. 943,653
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—354

258,195
BOTTLE OR SIMILAR ARTICLE
Richard L. Weckman, Perrysburg, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed May 18, 1978, Ser. No. 907,076
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—378



258,196
JUG
Gerald J. Adamson, Toronto, Canada, assignor to The Coleman Company, Inc., Wichita, Kans.
Filed Jan. 5, 1979, Ser. No. 1,181
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—376

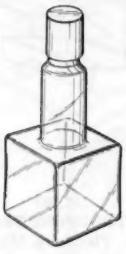


258,197
BOTTLE OR SIMILAR ARTICLE
Everett C. Beeman, Wallingford, Conn., assignor to Monsanto Company, St. Louis, Mo.
Filed Feb. 26, 1979, Ser. No. 15,251
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—349

258,198
BOTTLE
Michael Segal, 2265 Sunset Rd., Mount Royal, Canada
Filed Mar. 26, 1979, Ser. No. 23,932
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—355

258,199
ROLL-ON DISPENSER
Albert H. Torongo, Jr., Yardley, Pa., assignor to Bristol-Myers Company, New York, N.Y.
Filed Sep. 1, 1978, Ser. No. 939,294
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—338

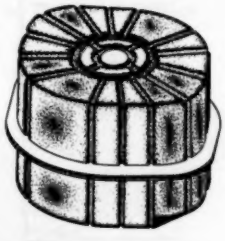
258,200
BOTTLE
Björn Weckström, Helsinki, Finland, assignor to Oy Heinrich Frentz Ab, Helsinki, Finland
Filed Jan. 8, 1979, Ser. No. 1,880
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—401



258,202
BOTTLE
Barbara Astor, Pelham Manor, and John J. Scalice, New York, both of N.Y., assignors to Revlon, Inc., New York, N.Y.
Filed Jul. 31, 1978, Ser. No. 929,829
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—352

258,201
PERFUME BOTTLE
Oleg Cassini, New York, N.Y., assignor to Oleg Cassini, Inc., New York, N.Y.
Filed Mar. 23, 1978, Ser. No. 889,610
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—331

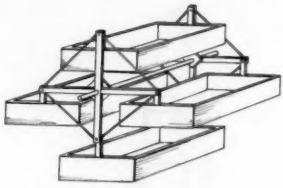
258,203
COMPUTER DISC CONTAINER
Lorene E. Elzea, Redwood City, and Robert G. Atwood, Foster City, both of Calif., assignors to Bozley, Inc., Foster City, Calif.
Filed Dec. 26, 1978, Ser. No. 973,022
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—426



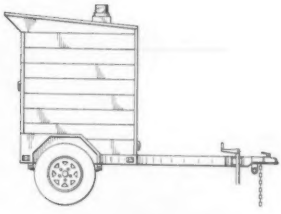
258,204
COMBINED HANDLED PHONOGRAPH RECORD ENVELOPE AND RAIN COVER THEREFOR
Carl Rudenschold, Fack, Sågspånsgatan 20, 400 14 Göteborg, Sweden
Filed Aug. 7, 1978, Ser. No. 931,815
Claims priority, application Sweden, Feb. 8, 1978, 780353; Feb. 8, 1978, 780354
Term of patent 14 years
Int. Cl. D9—*05*
U.S. Cl. D9—305

258,205
HALLOWEEN BAG, OR SIMILAR ARTICLE
Frederick H. Kroll, 72 Wood Hollow La., New Rochelle, N.Y. 10804
Filed Aug. 8, 1978, Ser. No. 932,038
Term of patent 14 years
Int. Cl. D9—*05*
U.S. Cl. D9—305

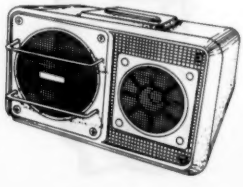
258,206
ROTATABLE PLANT CONTAINER UNIT
Aubrey M. Bourke, 16 Mariemont Ave., Wantirna Victoria 3152, Australia
Filed Aug. 23, 1978, Ser. No. 936,069
Claims priority, application Australia, Apr. 10, 1978, 74442
Term of patent 14 years
Int. Cl. D11—*02;* D6—*06*
U.S. Cl. D11—156



258,207
MULTI-PURPOSE TRAILER
Raymond G. Paulk, Sr., Plattsburg, Mo. 64477
Filed Dec. 15, 1978, Ser. No. 969,981
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—102

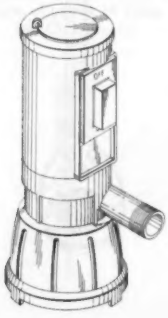


258,208
LOUDSPEAKER
Manabu Kawachi, Tokyo, Japan, assignor to Pioneer Kabushiki Kaisha, Tokyo, Japan
Filed May 4, 1978, Ser. No. 903,023
Claims priority, application Japan, Nov. 4, 1977, 52-43713
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D14—34

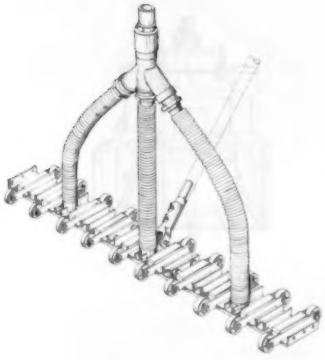


258,209
MAGNETIC TAPE TRANSPORT UNIT OR SIMILAR ARTICLE
Charles D. Flanigan, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Sep. 27, 1978, Ser. No. 946,302
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—41

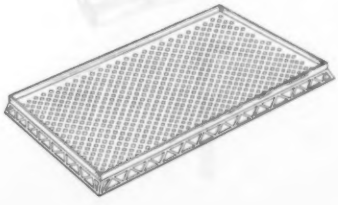
258,210
SUBMERSIBLE PUMP OR THE LIKE
Alan Shure, Chicago, Ill., assignor to International Components Corporation, Chicago, Ill.
Filed Feb. 2, 1979, Ser. No. 9,239
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—7



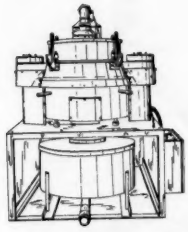
258,211
HEAD FOR A CONTOUR FORMING UNDERWATER VACUUM SWEEP
Marty St. Martin, Phoenix, Ariz., assignor to Maxi-Sweep, Inc., Phoenix, Ariz.
Filed Apr. 27, 1978, Ser. No. 901,280
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—63



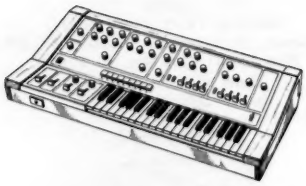
258,212
DRYING TRAY FOR FRUIT
George D. Negrete, 15156 S. Cedar, Fresno, Calif. 93725
Filed Jun. 11, 1979, Ser. No. 47,033
Term of patent 14 years
Int. Cl. D15—*99*; D07—*99*
U.S. Cl. D15—92



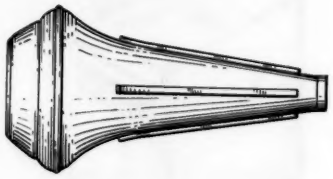
258,213
VIBRATORY STRAINING MACHINE
Geoffrey H. Lydford, Orpington, England, assignor to Russell Finex Limited, London, England
Filed Nov. 30, 1977, Ser. No. 856,541
Claims priority, application United Kingdom, Sep. 21, 1977, 981598/77
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—147



258,214
SYNTHESIZER ORGAN, OR THE LIKE
Yasuhiro Kira, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan
Filed Jan. 22, 1979, Ser. No. 5,356
Claims priority, application Japan, Aug. 5, 1978, 53-33241
Term of patent 14 years
Int. Cl. D17—*01*
U.S. Cl. D17—5



258,215
MUTE FOR BRASS INSTRUMENTS
Willie Berg, Homewood, Ill., assignor to Humes and Berg Mfg. Co., Inc., East Chicago, Ind.
Filed Sep. 22, 1978, Ser. No. 944,928
Term of patent 14 years
Int. Cl. D17—*02*
U.S. Cl. D17—13



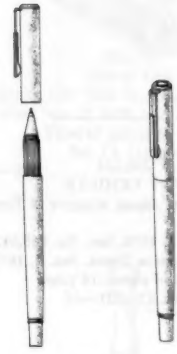
258,216
SYNTHESIZER
Franklin N. Eventoff, 2351 Lake View Ave., Los Angeles, Calif. 90034
Filed Apr. 23, 1979, Ser. No. 32,041
Term of patent 14 years
Int. Cl. D17—*99*
U.S. Cl. D17—99

258,217

MECHANICAL PENCIL OR SIMILAR ARTICLE

Gouji Sakaoka, Tokyo, Japan, assignor to Pentel Kabushiki Kaisha, Japan

Filed Apr. 5, 1979, Ser. No. 27,401
Claims priority, application Japan, Oct. 26, 1978, 53-45604
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—49



258,218

BALL POINT PEN OR SIMILAR ARTICLE

Shigeo Oka, Tokyo, Japan, assignor to Pentel Kabushiki Kaisha, Japan

Filed Apr. 5, 1979, Ser. No. 27,402
Claims priority, application Japan, Oct. 6, 1978, 53-42591
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—49

258,219

AUTOMATIC PENCIL OR SIMILAR ARTICLE

Shigeo Oka, Tokyo, Japan, assignor to Pentel Kabushiki Kaisha, Japan

Filed Jun. 6, 1979, Ser. No. 46,054
Claims priority, application Japan, Dec. 15, 1978, 53-52918
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—49

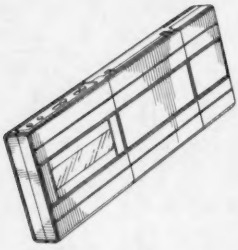
258,220

CLIP FOR A WRITING INSTRUMENT OR THE LIKE

Shigeo Oka, Tokyo, Japan, assignor to Pentel Kabushiki Kaisha, Japan

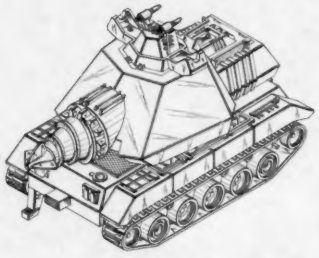
Filed Jun. 7, 1979, Ser. No. 46,495
Claims priority, application Japan, Dec. 27, 1978, 53-55282
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—56

258,221
COMBINED DIGITAL CLOCK AND CALCULATOR
Kenji Shimasaki, Hong Kong, assignor to Cassia Electronic Products Limited, Aberdeen, Hong Kong
Filed Dec. 18, 1978, Ser. No. 970,114
Claims priority, application United Kingdom, Oct. 18, 1978, 986915/78
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7

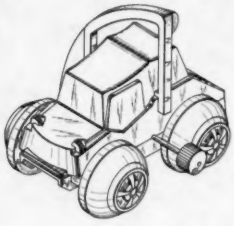


258,222
TOY JACK
Royce D. Rumsey, Hopkins, and Ronald R. Pauly, Mound, both of Minn., assignors to Tonka Corporation, Hopkins, Minn.
Filed Jan. 23, 1978, Ser. No. 871,431
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—124

258,223
TOY TANK
Hitoshi Itakura, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Dec. 4, 1978, Ser. No. 966,471
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—131



258,224
TOY VEHICLE
Keiichi Murasaki, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Dec. 1, 1978, Ser. No. 965,612
Claims priority, application Japan, Jun. 3, 1978, 53-23239
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—137

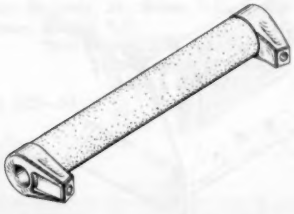


258,225
TOY RAILROAD CAR RAILER OR SIMILAR ARTICLE
Harold J. Rawson, 825 W. Tenth St., Corona, Calif. 91720
Filed Dec. 11, 1978, Ser. No. 968,490
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—143

258,226
SIMULATIVE WATER TOY
Robert Strickland, 1965 S. Beverly Glen Blvd., Los Angeles, Calif. 90025
Filed Jun. 19, 1978, Ser. No. 917,006
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—157

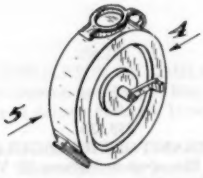
258,227
GOLF TEE
Willard J. Coonen, 1202 12th St., Sioux City, Iowa 51105
Filed Nov. 2, 1978, Ser. No. 957,243
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—208

258,228
WATER SKI ROPE HANDLE
James T. Rumbaugh, Spirit Lake, Iowa, assignor to Berkley & Company, Inc., Spirit Lake, Iowa
Filed Mar. 16, 1978, Ser. No. 887,200
The portion of the term of this patent subsequent to Jul. 18, 1992, has been disclaimed.
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—230



258,229
SKI POLE
Hannes Marker, Haupstrasse 51-53, 81 Garmisch-Partenkirchen, Fed. Rep. of Germany
Filed Jun. 23, 1978, Ser. No. 918,459
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1977, 11185
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—230

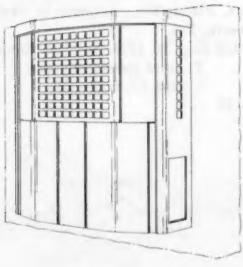
258,230
PORTABLE GOLF BALL WASHER
Alex J. Duda, 1704 S. Pennsylvania, Lansing, Mich. 48910
Filed Apr. 23, 1979, Ser. No. 32,161
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—234



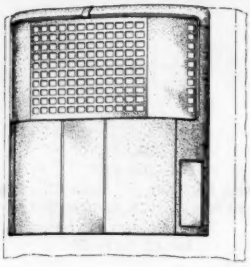
258,231
FISHING ROD HANDLE
Tom P. Airhart, Plano, Tex., assignor to Skyline Industries, Inc., Fort Worth, Tex.
Filed Aug. 31, 1978, Ser. No. 938,982
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—23

258,232
SOLAR COLLECTOR PANEL
Frederick A. Weis, Englewood, Colo., assignor to Solar Specialties, Inc., Englewood, Colo.
Filed Apr. 27, 1979, Ser. No. 33,951
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—72

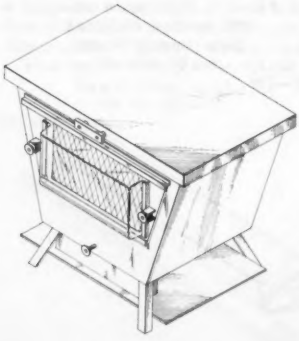
258,233
COVER FOR TRANSPORT REFRIGERATION UNIT
David H. Taylor, Bloomington; Herman H. Viegas, Richfield, and Rodney H. Volk, Eden Prairie, all of Minn., assignors to Thermo King Corporation, Minneapolis, Minn.
Filed Jan. 8, 1979, Ser. No. 1,994
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—142



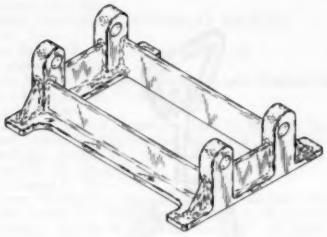
258,234
COVER FOR TRANSPORT REFRIGERATION UNIT
Lowell M. Anderson, Bloomington; William F. Arendt, Burnsville, both of Minn.; Clarence F. Graser, Venice, Fla.; Herman H. Viegas, Richfield, and Rodney H. Volk, Eden Prairie, both of Minn., assignors to Thermo King Corporation, Minneapolis, Minn.
Filed May 11, 1979, Ser. No. 38,363
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—142



258,235
COMBINED FIREPLACE AND HEATING STOVE
Edwin S. F. Francis, 3930 Hobbs St., Victoria, B.C., Canada
Filed May 16, 1979, Ser. No. 39,500
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



258,236
SLIDE SUPPORT FOR A CHIROPRACTIC TABLE
James E. Barnes, Fort Wayne, Ind., assignor to James W. Cox, Fort Wayne, Ind., a part interest
Filed Mar. 22, 1978, Ser. No. 889,092
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—7



258,237
SURGICAL INSTRUMENT
William Anspach, Palm Beach Gardens, Fla., assignor to The Anspach Effort, Inc., Palm Beach Gardens, Fla.
Filed Jul. 17, 1978, Ser. No. 925,445
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—28

258,238
PATIO DECK OR THE LIKE
Benjamin F. Grady, Jr., Selma, N.C., assignor to Elaine E. Sandman, Raleigh, N.C.
Filed Jan. 16, 1978, Ser. No. 869,870
Term of patent 14 years
Int. Cl. D25—*23*
U.S. Cl. D25—35

258,239
COMB
Jan M. Zwiren, Chicago, Ill., assignor to Helene Curtis Industries, Inc.
Filed Jan. 10, 1979, Ser. No. 2,301
Term of patent 14 years
Int. Cl. D04—*02*; D28—*03*
U.S. Cl. D28—28

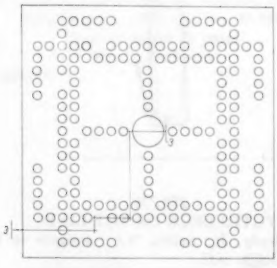
258,240
COSMETIC APPLICATOR OR SIMILAR ARTICLE
Yuzo Takada, Los Angeles, and Sang Y. Rim, Cerritos, both of Calif., assignors to Arigato Fashions, Incorporated, Los Angeles, Calif.
Filed Nov. 13, 1978, Ser. No. 959,992
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—7

258,241
COSMETIC APPLICATOR OR SIMILAR ARTICLE
Yuzo Takada, Los Angeles, and Sang Y. Rim, Cerritos, both of Calif., assignors to Arigato Fashions, Incorporated, Los Angeles, Calif.
Filed Nov. 13, 1978, Ser. No. 960,452
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—7

258,242
RAZOR HANDLE
Christopher J. Hood, East Horsley, and Trevor F. Gooding, Guildford, both of England, assignors to Wilkinson Sword, Ltd., High Wycombe, England
Filed Apr. 12, 1979, Ser. No. 29,386
Claims priority, application United Kingdom, Oct. 26, 1978, 987027/78
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—48

258,243
CANINE QUICK RELEASE COLLAR
Charles A. Barbero, Jr., Star Route, Brownsville, and Keith E. Webb, 3360 Woodleaf Star Route, Forbestown, both of Calif.
Filed Apr. 13, 1979, Ser. No. 29,761
Term of patent 14 years
Int. Cl. D30—*04*
U.S. Cl. D30—39

258,244
GAME BOARD
Horace D. Brown, 9817 S.W 93rd Ter., Miami, Fla. 33176
Filed Nov. 30, 1977, Ser. No. 856,186
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—20



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 10TH DAY OF FEBRUARY, 1981

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

"A"-Company, Inc.: *See*—
Andrews, Lawrence F., 4,249,898, Cl. 433-21.000.

A-Dec, Inc.: *See*—
Davis, Eugene B., 4,249,899, Cl. 433-32.000.

Abbott Laboratories: *See*—
Martin, Jerry R.; Tadanier, John S.; Johnson, Paulette; and Nadzan, Alex M., 4,250,304, Cl. 536-17.00R.

Abele, Karl M.: *See*—
Korenev, Vladimir P.; Ippolitov, Jury S.; Belyaev, Boris P.; Kalninsh, Arvid Y.; Vedernikov, Nikolai A.; Krastinsh, Valter P.; Abolinsh, Guntis K.; Abele, Karl M.; and Ekis, Felix A., 4,249,703, Cl. 241-247.000.

Abolinsh, Guntis K.: *See*—
Korenev, Vladimir P.; Ippolitov, Jury S.; Belyaev, Boris P.; Kalninsh, Arvid Y.; Vedernikov, Nikolai A.; Krastinsh, Valter P.; Abolinsh, Guntis K.; Abele, Karl M.; and Ekis, Felix A., 4,249,703, Cl. 241-247.000.

Acieries Reunies de Burbach-Eich-Dudelage S.A. Arbed: *See*—
Herrig, Klaus; and Wagner, Heinz, 4,249,359, Cl. 53-118.000.

Action Target Products, Inc.: *See*—
Lee, Robert W., 4,249,743, Cl. 273-391.000.

Adams, Frank H. Milking apparatus and method. 4,249,481, Cl. 119-14.020.

Admiral Maschinenfabrik GmbH: *See*—
Oppl, Othmar; and Jaeger, Hermann-Siegfried, 4,249,881, Cl. 425-543.000.

Adolph, Erich; Bayrak, Unal; Prohl, Robert; Schmidt, Gerhard; and Stecker, Walter, to Siemens Aktiengesellschaft. Electric switch gear section. 4,250,535, Cl. 361-335.000.

Adver-Togs, Inc.: *See*—
Price, James E., 4,249,269, Cl. 2-195.000.

AEG-Elotherm, G.m.b.H.: *See*—
Reinke, Friedhelm; and Stengel, Edgar, 4,249,724, Cl. 266-261.000.

Agarwal, Dwarika P.: *See*—
Mohammed, M. Hamdi A.; Agarwal, Dwarika P.; and Ingersoll, Clyde E., 4,249,943, Cl. 75-171.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Cases, Jean M.; Valence, Georges; and Lietard, Olivier, 4,250,027, Cl. 209-233.000.
Constant, Georges; Haran, Raymond; Lebugle, Albert; Zaouk, Aref; Morancho, Roland; and Pouvreau, Philippe, 4,250,205, Cl. 427-87.000.

Agency of Industrial Science and Technology: *See*—
Tahara, Kazuo; Tagima, Fumio; Motegi, Shoji; and Saito, Shigeki, 4,250,422, Cl. 310-227.000.

AGFA-Gevaert, A.G.: *See*—
Boser, Heinz; and Jelinek, Nikolaus, 4,249,819, Cl. 354-312.000.
Odenwalder, Heinrich; Vetter, Hans; Puschel, Walter; and Ranz, Erwin, 4,250,252, Cl. 430-505.000.

Ahrens, Walter C. Switch-arc preventing circuit. 4,250,531, Cl. 361-2.000.

Air Products and Chemicals, Inc.: *See*—
Beitchman, Burton D.; Jefferson, Donald E.; and Seymour, John P., 4,250,293, Cl. 528-93.000.
Sircar, Shivaji; and Kratz, Wilbur C., 4,249,915, Cl. 55-26.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Sakakibara, Naoji, 4,249,457, Cl. 91-450.000.

Akaura, Seishiro; Nagamune, Yasushi; and Nakamura, Takeshi, to Ashimori Kogyo Kabushiki Kaisha. Apparatus for producing foamed plastic type cork lines. 4,249,872, Cl. 425-111.000.

Akita, Yoshio: *See*—
Iwaki, Katsutaro; Mori, Kazumasa; Mase, Akira; Nimura, Takayasu; Itoh, Katsumi; Akita, Yoshio; Muto, Katsuya; Asahi, Taro; and Banzai, Keiichiro, 4,250,444, Cl. 322-28.000.

Aksola, Tauno. Control apparatus for air intake in oil burners of heating boilers. 4,249,856, Cl. 415-25.000.

Aktiengesellschaft "Weser" Werft Bremen: *See*—
Janssen, Hans-Georg, 4,249,765, Cl. 294-84.000.

Akzona Incorporated: *See*—
O'Connor, John J., 4,250,394, Cl. 250-574.000.

Alaspa, Allan A., to Motorola, Inc. Single clock CMOS logic circuit with selected threshold voltages. 4,250,406, Cl. 307-205.000.

Albany International Corp.: *See*—
Bolton, Joseph A.; and Huhtala, Olavi A., 4,249,399, Cl. 68-20.000.

Albizzati, Enrico: *See*—
Giannini, Umberto; Albizzati, Enrico; and Parodi, Sandro, 4,250,104, Cl. 260-448.0AD.

Alfonsin, Manuel: *See*—
Vergara, Hector F.; and Alfonsin, Manuel, 4,249,742, Cl. 273-294.000.

Algieri, Aldo A.; and Crenshaw, Ronnie R., to Bristol-Myers Company. Pyridyl guanidine anti-ulcer agents. 4,250,316, Cl. 546-287.000.

Ali-Zaidi, Syed R., to Glass Containers Corporation. Composition for coating glass containers. 4,250,068, Cl. 260-28.50R.

Allen-Bradley Company: *See*—
Graninger, Frank J.; and Frey, Robert J., 4,250,477, Cl. 335-169.000.
Kouchich, Allan V.; Radosevich, Lawrence D.; Blanchard, John C.; and Thomas, Neal F., 4,250,482, Cl. 338-275.000.
Struger, Odo J., 4,250,563, Cl. 364-900.000.

Allen Engineering Corporation: *See*—
Allen, J. Dewayne, 4,249,327, Cl. 404-114.000.

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Allen, Joseph C., to Texaco Inc. Miscible displacement oil recovery method. 4,249,607, Cl. 166-274.000.

Alley, Robert P.; and Weischedel, Richard C., to General Electric Company. Clock rate control of electronically commutated motor rotational velocity. 4,250,435, Cl. 318-138.000.

Alley, Robert P., to General Electric Company. Combination microprocessor and discrete element control system for a clock rate controlled electronically commutated motor. 4,250,544, Cl. 364-110.000.

Allibert Exploitation, Societe Anonyme: *See*—
Cornou, Jean, 4,249,357, Cl. 52-728.000.

Allied Chemical Corporation: *See*—
DeCristofaro, Nicholas J.; Freilich, Alfred; and Nathasingh, Davidson M., 4,249,969, Cl. 148-108.000.

Allis-Chalmers Corporation: *See*—
Moe, Richard G., 4,249,616, Cl. 172-311.000.

Alstad, John A. Storage apparatus. 4,249,852, Cl. 414-514.000.

Alsthom-Atlantique: *See*—
Condolios, Elie, 4,249,828, Cl. 366-102.000.

Altshuler, Judif M.: *See*—
Efimov, Alexei V.; Berlin, Alfred A.; Kefeli, Tamara Y.; Varlamova, Nina V.; Strongin, Grigory M.; Altshuler, Judif M.; and Kolomazov, Boris I., 4,250,322, Cl. 560-26.000.

Alza Corporation: *See*—
Heller, Jorge; and Baker, Richard W., 4,249,531, Cl. 128-260.000.

Amari, Hiroshi: *See*—
Shirahata, Ryuji; Kitamoto, Tatsuji; Suzuki, Masaaki; and Amari, Hiroshi, 4,250,225, Cl. 428-336.000.

Amerace Corporation: *See*—
Yap, Crescencio T.; and Castelbaum, Leonard, 4,249,971, Cl. 156-143.000.

American Can Company: *See*—
Guarnery, Joseph M.; and Kester, Dennis E., 4,250,006, Cl. 204-159.180.
Schlesinger, Sheldon I.; and Kester, Dennis E., 4,250,203, Cl. 427-44.000.
Yang, Lau S., 4,250,088, Cl. 260-124.00R.

American Cyanamid Company: *See*—
Floyd, Middleton B., Jr., 4,250,321, Cl. 560-53.000.
Floyd, Middleton B., Jr., 4,250,323, Cl. 560-53.000.
Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-Mei L., 4,250,325, Cl. 560-121.000.

American Hoechst Corporation: *See*—
Doering, August P., 4,250,242, Cl. 430-141.000.

American Seating Company: *See*—
Barecki, Chester J., 4,249,769, Cl. 296-65.00A.

Ameron, Inc.: *See*—
Foscante, Raymond E.; Gysegem, Albert P.; Martinich. Pamela J.; and Law, Gabriel H., 4,250,074, Cl. 260-32.8EP.

AMSTED Industries Incorporated: *See*—
Parshall, David G., 4,250,036, Cl. 210-297.000.

Amster, Harlan D. Game racket. 4,249,731, Cl. 273-73.00D.

Amsterdamse Ballast Bagger: *See*—
Wolters, Tjako A., 4,250,034, Cl. 210-170.000.

Analog Devices, Incorporated: *See*—
Brokaw, Adrian P., 4,250,445, Cl. 323-313.000.

Ancher, Jean-Francois R.: *See*—
Bucher, Bernard P.; Ancher, Jean-Francois R.; and Imbert, Thierry F., 4,250,178, Cl. 424-251.000.

Anders, Dietmar; and Voigt, Jurgen, to Hermann Berstorff Maschinenbau GmbH. Granulating apparatus. 4,249,879, Cl. 425-311.000.

Anderson, Billy B., to Vega Industries, Inc. Hearth ventilators for domestic fireplaces. 4,249,510, Cl. 126-121.000.

Anderson, Bruce W.; Jessup, Gregory M.; and Preniczny, Robert B., to Bendix Corporation, The. Oxidation inhibiting cap for a carbon friction disc. 4,249,642, Cl. 188-73.200.

Anderson, Earl R.; and Johnson, Lee E., to Chatfield, Douglas E.; and Novak, Frank. Modified dovetail joint. 4,249,355, Cl. 52-593.000.

Anderson, Frohman C. Line pipe forming apparatus and method. 4,249,406, Cl. 72-52.000.

Anderson, George C. Knee stabilizer. 4,249,524, Cl. 128-80.00C.

Anderson, Martin C.; and Lonier, David T. Basic color media set for providing tonally matched palettes. 4,249,318, Cl. 434-103.000.

Anderson, Martin L.: *See—*
Christy, Ronald I.; and Anderson, Martin L., 4,249,312, Cl. 30-315.000.

Anderson, Roland M. Modular cushioning orthodontic bracket structure. 4,249,897, Cl. 433-8.000.

Anderson, Wesley J.: *See—*
Fields, Samuel; and Anderson, Wesley J., 4,249,626, Cl. 180-54.00A.

Andis Company: *See—*
Andis, Matthew L., 4,249,307, Cl. 30-216.000.

Andis, Matthew L., to Andis Company. Hair clipper. 4,249,307, Cl. 30-216.000.

Andreasen, Norman H. Portable tools for removing snow from pitched roofs. 4,249,767, Cl. 294-19.00R.

Andreasson, Sven A. G. Invalid chair. 4,249,774, Cl. 297-311.000.

Andreoni, Alessandro: *See—*
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Alessandro; Fumagalli, Angelo; Faustini, Franco; Ceserani, Roberto; and Usardi, Maria M., 4,250,188, Cl. 424-285.000.

Andrews, Earl C., to Hardinge Brothers, Inc. One-piece collet and process for making same. 4,249,748, Cl. 279-46.00R.

Andrews, Lawrence F., to "A"-Company, Inc. Orthodontic rotation spring. 4,249,898, Cl. 433-21.000.

Antenore, Ronald L. Dry product dispenser. 4,249,674, Cl. 222-153.000.

Antos, George J., to UOP Inc. Hydrocarbon conversion with an attenuated superactive multimetallic catalytic composite. 4,250,020, Cl. 208-139.000.

Antos, George J.: *See—*
Flagg, John F.; and Antos, George J., 4,250,055, Cl. 252-441.000.

Aoki, Akihiro: *See—*
Tamura, Yorikazu; Aoki, Akihiro; Mera, Hiroshi; and Shimada, Keizo, 4,250,073, Cl. 260-32.6NA.

Apffel, Fred P.: *See—*
Solbakken, Age; Apffel, Fred P.; Robinson, Sam P.; and Hayes, Bobby L., 4,250,158, Cl. 423-449.000.

Apjok, Jozsef: *See—*
Felfoldi, Karoly; Apjok, Jozsef; Bartok, Mihaly; Czombos, Jozsef; Molnar, Arpad; Noteisz, Ferenc; Karpati, Egon; and Szporny, Laszlo, 4,250,310, Cl. 544-379.000.

Aquasonics, Inc.: *See—*
Woodland, Sylvester L., 4,249,660, Cl. 209-555.000.

Arai, Tohru, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Method for forming a two-layered carbide surface on a ferrous-alloy article and resulting product. 4,250,208, Cl. 427-249.000.

Arcanum Corporation: *See—*
Caswell, Bruce F., 4,249,905, Cl. 23-313.00R.

Archer, Jean F., to STAS Societe Technique d'Accessoires Specialises. Load-carrying slings. 4,249,474, Cl. 116-212.000.

Arendt, Hans F. Water-extraction press. 4,249,400, Cl. 68-242.000.

Argo, Wesley B.; Kocatas, Babur M.; and Ziebold, S. A., to Monsanto Company. Fiber bed element and process for removing aerosols from gases. 4,249,918, Cl. 55-97.000.

Argus Chemical Corp.: *See—*
Nakahara, Yutaka; Kubota, Naohiro; and Shibata, Toshihiro, 4,250,312, Cl. 546-19.000.
Nakahara, Yutaka; Kubota, Naohiro; and Shibata, Toshihiro, 4,250,313, Cl. 546-19.000.

Armstrong, Douglas, to Coulter Electronics, Inc. Preservative for use in calibrator compositions for blood analysis. 4,250,051, Cl. 252-408.000.

Armstrong, Robin E. Musical instrument. 4,249,449, Cl. 84-173.000.

Arnold, Francis T.: *See—*
Freeman, Lawrence M.; and Arnold, Francis T., 4,249,820, Cl. 355-29.000.

Arnold, Harold D., to Emerson Electric Co. Air deflector for electric motor. 4,250,417, Cl. 310-62.000.

Arnold, Robert D. Vehicle speed recorder. 4,250,487, Cl. 340-62.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Nishikido, Joji; Tamura, Nobuhiro; Fukuoka, Yohei; and Yamane, Hiroyuki, 4,250,110, Cl. 564-156.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Kawasaki, Masahiro; and Sawada, Yoshio, 4,250,413, Cl. 307-293.000.

Asahi, Taro: *See—*
Iwaki, Katsutaro; Mori, Kazumasa; Mase, Akira; Nimura, Takayasu; Itoh, Katsumi; Akita, Yoshio; Muto, Katsuya; Asahi, Taro; and Banzai, Keiichiro, 4,250,444, Cl. 322-28.000.

Asakawa, Toshifumi: *See—*
Fuwa, Jyoichi; and Asakawa, Toshifumi, 4,250,526, Cl. 358-294.000.

Asano, Shuichi, to Nippon Seiko Kabushiki Kaisha. Emergency locking mechanism for the seat belt retractor of vehicles. 4,249,708, Cl. 242-107.200.

Asbeck, Adolf; Eckelt, Michael; Erwied, Werner; Heyden, Rudi; and Petzold, Manfred, to Henkel Kommanditgesellschaft auf Aktien. Sulfosuccinate emulsifiers. 4,250,050, Cl. 252-354.000.

Ashcroft, Richard I.; Kaktovics, David; Monson, Anthony E. P.; and Weeks, David M., to United Glass Limited. Apparatus for identifying production codes on articles. 4,250,405, Cl. 235-456.000.

Ashimori Kogyo Kabushiki Kaisha: *See—*
Akaura, Seishiro; Nagamune, Yasushi; and Nakamura, Takeshi, 4,249,872, Cl. 425-111.000.

Astec Industries, Inc.: *See—*
Brock, J. Donald, 4,249,351, Cl. 52-64.000.

Atherton, Frank R.; Hall, Michael J.; Hassall, Cedric H.; Lambert, Robert W.; and Ringrose, Peter S., to Hoffmann-La Roche Inc. Acyl derivatives. 4,250,085, Cl. 260-112.50R.

Atkisson, A. David, to Eagle-Picher Industries, Inc. Ionic compounds formed from iron and urea. 4,249,930, Cl. 71-28.000.

Atlantic Richfield Company: *See—*
Masologites, George P.; Sun, Jui-Yuan; Yoo, Jin S.; and Burk, Emmett H., Jr., 4,249,910, Cl. 44-1.0SR.

Audisio, Filippo: *See—*
Rivetti, Enrico; and Audisio, Filippo, 4,249,512, Cl. 126-435.000.

August, Paul R.; and Reed, George A., to University of Delaware. Anomer enrichment of alkyl glycosides of amino sugars. 4,250,301, Cl. 536-4.000.

Auscoteng Pty. Ltd.: *See—*
Foley, Norman L., 4,249,864, Cl. 417-77.000.

Ausnit, Steven, to Minigrip, Inc. Apparatus for making reclosable bags. 4,249,982, Cl. 156-461.000.

Austin, Kevin B.: *See—*
Blum, Herbert; and Austin, Kevin B., 4,250,554, Cl. 364-560.000.

Auto Register, Inc.: *See—*
Margolin, George D.; and Vurpillat, Victor V., 4,249,552, Cl. 133-1.00R.

Automobiles Peugeot: *See—*
Froumajou, Armand, 4,249,753, Cl. 280-673.000.
Level, Jean-Paul; and Buffard, Guy, 4,249,645, Cl. 188-322.000.

Avon Products, Inc.: *See—*
Doremus, John F., 4,250,133, Cl. 264-130.000.

B. M. Costamagna et Cie: *See—*
Feuillade, Jean L. J., 4,249,440, Cl. 83-155.000.
Feuillade, Jean Louis J., 4,249,873, Cl. 425-111.000.

B. W. Darrah, Inc.: *See—*
Karr, Edward J., 4,249,309, Cl. 30-240.000.

Babcock, Alan R.: *See—*
Kuit, Wouterus J. M.; and Babcock, Alan R., 4,250,030, Cl. 210-684.000.

Babcock & Wilcox Company, The: *See—*
Keyes, Marion A., IV; Malcolm, Jack W.; and Thompson, William L., 4,250,558, Cl. 364-607.000.

Babler, Fridolin, to Ciba-Geigy Corporation. Process for the manufacture of a perylene-3,4,9,10-tetracarboxylic dianhydride pigment with improved properties. 4,250,079, Cl. 260-42.210.

Babson, Arthur L.; and Turner, James E., to Warner-Lambert Company. Removal of heparin from blood plasma samples using an insoluble protamine reaction product. 4,250,041, Cl. 252-1.000.

Bader, Hartmann: *See—*
Baumann, Hans; and Bader, Hartmann, 4,249,579, Cl. 139-92.000.

Baes, Emile; Navez, Jean-Pierre; and Della Faille de Leverghem, Marc, to S.A. Redco. Composition of a material based on mineral fibers. 4,249,991, Cl. 162-152.000.

Bahler, Andre; Gschwend, Norbert; and Scheier, Heinrich, to Sulzer Brothers Limited. Endoprosthesis for a knee joint. 4,249,270, Cl. 3-1.911.

Baigrie, Brian D.; Bailey, Joseph; Johnston, Linda G.; and Mijovic, Miroslav V., to Eastman Kodak Company. Photographic products and processes employing novel dye developer compounds. 4,250,238, Cl. 430-17.000.

Bailey, Charles H., to UOP Inc. Caseless monolithic catalytic converter. 4,250,146, Cl. 422-179.000.

Bailey, Jesse M., Jr.: *See—*
Pobst, David F., Jr.; and Bailey, Jesse M., Jr., 4,250,145, Cl. 422-151.000.

Bailey, Joseph: *See—*
Baigrie, Brian D.; Bailey, Joseph; Johnston, Linda G.; and Mijovic, Miroslav V., 4,250,238, Cl. 430-17.000.

Bailey, Thomas F., to Brown Oil Tools, Inc. Double cylinder system. 4,249,600, Cl. 166-77.000.

Bain Ultra Quebec Inc.: *See—*
Carrier, Roger, 4,249,522, Cl. 128-66.000.

Baker, Richard W.: *See—*
Heller, Jorge; and Baker, Richard W., 4,249,531, Cl. 128-260.000.

Baker, Thomas R., to Kliklok Corporation. Method of forming a heat resistant carton. 4,249,978, Cl. 156-291.000.

Balaban, Alvin R.: *See—*
Steckler, Steven A.; and Balaban, Alvin R., 4,250,525, Cl. 358-148.000.

Balaban, John A. String pre-stretching apparatus and method for racket stringing machine. 4,249,732, Cl. 273-73.00A.

Ballast-Nedam Groep N.V.: *See—*
Wolters, Tjako A., 4,250,034, Cl. 210-170.000.

Ballmann, Josef. Projectile. 4,249,465, Cl. 102-38.00R.

Bambuch, Tadeusz; Wilusz, Henryk; Englert, Wieslaw; Czank, Stanislaw; and Surmiak, Stanislaw, to Huta Stalowa Wola-Kombinat Przemyslowy. Process for the chemical and thermal treatment of steel parts to improve the strength properties thereof. 4,249,964, Cl. 148-16.500.

Banks, Reginald G. S.; and Williams, Alan, to British Gas Corporation. Gas making calcined catalyst precursors of nickel, alumina, sodium and potassium. 4,250,060, Cl. 252-466.00J.

Banzai, Keiichiro: *See—*
Iwaki, Katsutaro; Mori, Kazumasa; Mase, Akira; Nimura, Takayasu; Itoh, Katsumi; Akita, Yoshio; Muto, Katsuya; Asahi, Taro; and Banzai, Keiichiro, 4,250,444, Cl. 322-28.000.

Barber-Colman Company: *See—*
Haug, Edward W.; and Smith, William C., 4,250,371, Cl. 219-69.00W.

Barecki, Chester J., to American Seating Company. Passive restraint for a vehicle. 4,249,769, Cl. 296-65.00A.

Baroncelli, Vittorio: *See—*
Renzi, Pierluigi; and Baroncelli, Vittorio, 4,250,253, Cl. 435-7.000.

Barringer, Jerry M.; and Harris, Raymond W., to General Electric Company. Interconnection arrangement for circuit boards. 4,250,536, Cl. 361-413.000.

Barron, John O. Valve clamp assembly. 4,249,716, Cl. 251-146.000.

Barry Wright Corporation: *See—*
Melendy, Harold A.; and Hamilton, Harold V., 4,249,380, Cl. 60-562.000.

Barth, Harry J., to Spanel, Abram N. Method for manufacturing girdles. 4,249,972, Cl. 156-165.000.

Barth, Leonard A., to Northern Telecom Limited. Apparatus for testing hardness of wooden poles. 4,249,414, Cl. 73-81.000.

Barthelemy, Pierre, to Roussel Uclaf. Process for the preparation of 7-amino-cephalosporanic acid. 4,250,307, Cl. 544-030.000.

Bartholomew, John T., to General Electric Company. Method for making close tolerance laminates. 4,249,977, Cl. 156-288.000.

Bartley, William J., to Union Carbide Corporation. Production of methyl and ethylamines with rhodium-iron catalysts. 4,250,116, Cl. 564-467.000.

Bartok, Mihaly: *See—*
Felfoldi, Karoly; Apjok, Jozsef; Bartok, Mihaly; Czombos, Jozsef; Molnar, Arpad; Noteisz, Ferenc; Karpati, Egon; and Szporny, Laszlo, 4,250,310, Cl. 544-379.000.

Baschang, Gerhard: *See—*
Sallmann, Alfred; and Baschang, Gerhard, 4,250,192, Cl. 424-309.000.

BASF Aktiengesellschaft: *See—*
Baumann, Manfred; and Hoffmann, Werner, 4,250,101, Cl. 260-348.570.
Buschmann, Ernst; Goetz, Norbert; Zeeh, Bernd; and Varwig, Juergen, 4,250,123, Cl. 260-185.000.
Denzinger, Walter; and Cordes, Claus, 4,250,289, Cl. 526-201.000.
Eilingsfeld, Heinz; Hansen, Guenter; Seybold, Guenther; and Zeidler, Georg, 4,250,090, Cl. 260-158.000.
Hansen, Hanspeter; Eicken, Karl; and Wuerzer, Bruno, 4,249,933, Cl. 71-88.000.
Hansen, Hanspeter; Eicken, Karl; and Wuerzer, Bruno, 4,249,935, Cl. 71-92.000.
Ley, Gregor; Penzel, Erich; Rebafka, Walter; and Bott, Kaspar, 4,250,070, Cl. 260-29.6MM.

Basile, Rocco F., to Thomas & Betts Corporation. Tool for use in cleaving fiber optic elements. 4,249,305, Cl. 30-164.900.

Bate, Robert T.; and Morris, Henry B., to Texas Instruments Incorporated. Method of making non-volatile semiconductor memory elements. 4,250,206, Cl. 427-88.000.

Bates, Kenneth L. Tire chain holder. 4,249,657, Cl. 206-335.000.

Bates, Richard G. H. Pruning device. 4,249,313, Cl. 30-391.000.

Batigelli, Jean A.: *See—*
Levecque, Marcel, deceased; Levecque, Marc, administrator; Batigelli, Jean A.; and Plantard, Dominique, 4,249,926, Cl. 65-5.000.

Battarel, Claude, to Crouzet. Magnetic domain propagation register. 4,250,566, Cl. 365-88.000.

Baudin, Pol; Leger, Lucien; and Collignon, Pierre, to BFG Glassgroup. Panel comprising at least one photo-voltaic cell and method of manufacturing same. 4,249,958, Cl. 136-251.000.

Bauer, Benjamin B., deceased; and by Bauer, Ida, executrix. Phonograph pick-up cartridge. 4,249,747, Cl. 369-136.000.

Bauer, Ida, executrix: *See—*
Bauer, Benjamin B., deceased; and Bauer, Ida, executrix, 4,249,747, Cl. 369-136.000.

Baumann, Hans; and Bader, Hartmann, to Sulzer Brothers Limited. Shaft for a weaving machine. 4,249,579, Cl. 139-92.000.

Baumann, Manfred; and Hoffmann, Werner, to BASF Aktiengesellschaft. Bis-epoxy-dialkoxy-alkanes. 4,250,101, Cl. 260-348.570.

Bausch, James F.; Brandt, Burkhard A.; and Sanford, Craig A., to Hewlett-Packard Company. Transformer bobbin assembly. 4,250,479, Cl. 336-208.000.

Baxter Travenol Laboratories, Inc.: *See—*
Coon, Clifford L.; and Simon, Robert L., 4,250,334, Cl. 568-683.000.
Groman, Ernest V., 4,250,162, Cl. 424-1.000.

Bayer Aktiengesellschaft: *See—*
Hugl, Herbert; Wolfrum, Gerhard; Reel, Henning; Kunnel, Werner; Kuth, Robert; and Gohrbandt, Wilhelm, 4,249,275, Cl. 8-532.000.
Keifer, Siegfried; and Volz, Hans G., 4,249,953, Cl. 106-193.00R.
Kruckenberg, Winfried; and Schundehutte, Karl H., 4,249,902, Cl. 8-525.000.
Lehmann, Wolfgang; Muller, Friedhelm; Lobach, Wilfried; Cramm, Gunther; and Hammerstrom, Knut, 4,250,298, Cl. 528-342.000.
Lehmann, Wolfgang; Muller, Friedhelm; Cramm, Gunther; Hammerstrom, Knut; and Lobach, Wilfried, 4,250,299, Cl. 528-342.000.
Leverenz, Klaus, 4,250,089, Cl. 260-141.000.
Lobach, Wilfried; Lehmann, Wolfgang; and Muller, Friedhelm, 4,250,112, Cl. 564-291.000.
Mues, Volker; and Behrenz, Wolfgang, 4,250,187, Cl. 424-282.000.
Niederdellmann, Georg; Goyert, Wilhelm; Meisert, Ernst; Eitel, Alfred; Wagner, Hans; and Hespe, Hans, 4,250,292, Cl. 528-44.000.
Nielinger, Werner; Brassat, Bert; and Vernaleken, Hugo, 4,250,297, Cl. 528-340.000.
Perrey, Hermann; and Matner, Martin, 4,250,071, Cl. 260-29.7NR.
von Bonin, Wulf; and Vehlewald, Peter, 4,250,077, Cl. 260-37.00N.

Baylac, Christiane: *See—*
de Panafieu, Arnaud; Baylac, Christiane; Nemaud, Yves; Turpin, Marc; and Faure, Michel, 4,249,924, Cl. 65-2.000.

Bayrak, Unal: *See—*
Adolph, Erich; Bayrak, Unal; Prohl, Robert; Schmidt, Gerhard; and Stecker, Walter, 4,250,535, Cl. 361-335.000.

BBC Brown Boveri & Company Limited: *See—*
Bearda, Pieter, 4,250,391, Cl. 250-504.00R.
Brul, Jakob; and Riegger, Helena, 4,249,485, Cl. 122-441.000.
Romeyke, Norbert, 4,249,371, Cl. 60-39.040.

Beach, Shirley, to Phillips Cables Limited. Material and apparatus for extruding a crosslinked polyolefin product. 4,250,132, Cl. 264-68.000.

Beard Industries, Inc.: *See—*
Noyes, Ronald T.; and Williams, Eugene E., 4,249,891, Cl. 432-14.000.

Bearda, Pieter, to BBC Brown Boveri & Company Limited. Apparatus for sterilizing liquids. 4,250,391, Cl. 250-504.00R.

Beasley, Marvin L.; and Rhode, Norman G. Water-degradable esters and process for the preparation thereof. 4,250,324, Cl. 560-62.000.

Beatrice Foods Co.: *See—*
Kohler, Thomas P., 4,250,432, Cl. 315-291.000.

Beck, Earl J. Diver operated bottom survey system. 4,249,314, Cl. 33-1.00H.

Beckerman, Howard L.; and Dob, Allan M., to Singer Company, The. Touch sensitive control panel and a method of manufacture thereof. 4,250,495, Cl. 340-365.00C.

Beecham Group Limited: *See—*
Cantello, Barrie C. C., 4,250,173, Cl. 424-246.000.

Been, Larry C. Apparatus for making dental bridgework. 4,249,591, Cl. 164-246.000.

Beery, Floyd T., to Hallmark Cards Incorporated. Air vent check valve. 4,249,676, Cl. 222-321.000.

Behrendt, Bernhard; Brenner, Gerhard; Fischer, Heinz; and Leipelt, Rudolf, to Filterwerk Mann & Hummel GmbH. Flapper linkage in air intake control system of internal combustion engine. 4,249,500, Cl. 123-556.000.

Behrenz, Wolfgang: *See—*
Mues, Volker; and Behrenz, Wolfgang, 4,250,187, Cl. 424-282.000.

Beitchman, Burton D.; Jefferson, Donald E.; and Seymour, John P., to Air Products and Chemicals, Inc. Latent amine salts of bis-phenol A. 4,250,293, Cl. 528-93.000.

Belfiore, Flavio. Optical pulley alignment tool. 4,249,294, Cl. 29-271.000.

Bell, Jack W., to Dobson Park Industries Limited. Vehicles including a materials supporting surface adapted for use in underground mining operations. 4,249,768, Cl. 296-63.000.

Bell, Robert P.: *See—*
Graham, Thomas E.; Thaxton, George H.; Mitchell, Francis M.; and Bell, Robert P., 4,250,226, Cl. 428-344.000.

Bell Telephone Laboratories, Incorporated: *See—*
Blahut, Donald E.; Copp, David H.; and Stanzione, Daniel C., 4,250,545, Cl. 364-200.000.
Davis, James A.; MacPherson, William F.; and Shackle, Peter W., 4,250,409, Cl. 307-252.00A.
Dragone, Corrado, 4,250,508, Cl. 343-779.000.
Kirsch, Howard C., 4,250,414, Cl. 307-296.00A.
Worlock, John M., 4,250,516, Cl. 357-16.000.

Belyaev, Boris P.: *See—*
Korenev, Vladimir P.; Ippolitov, Jury S.; Belyaev, Boris P.; Kalninsh, Arvid Y.; Vedernikov, Nikolai A.; Krastinsh, Valter P.; Abolinsh, Guntis K.; Abele, Karl M.; and Ekis, Felix A., 4,249,703, Cl. 241-247.000.

Benckiser-Knapsack GmbH: *See—*
Sommer, Klaus; and Schoebel, Gottfried, 4,250,107, Cl. 260-502.500.

Bendix Corporation, The: *See—*
Anderson, Bruce W.; Jessup, Gregory M.; and Preniczny, Robert B., 4,249,642, Cl. 188-73.200.
Bridges, Robert M., 4,250,351, Cl. 174-106.00R.
Brown, Arthur K., 4,249,452, Cl. 91-6.000.
Gaiser, Robert F.; and Lohraff, Larry G., 4,249,379, Cl. 60-562.000.
Gaiser, Robert F., 4,249,381, Cl. 60-562.000.
Kirner, Ernest O., 4,250,505, Cl. 343-5.0LS.
Massing, Lyle E., 4,249,458, Cl. 92-13.100.
Riggs, Robert R.; and Hunt, Paulmer D., 4,249,453, Cl. 91-59.000.
Roberts, James K., 4,249,646, Cl. 188-328.000.

Bengtson, Olle: *See—*
Wooler, Alan M.; and Bengtson, Olle, 4,249,949, Cl. 106-90.000.

Bennett, Robert A. Draft/free safety enclosure. 4,250,349, Cl. 174-67.000.

Benson, Bengt A. Erasing knife. 4,249,306, Cl. 30-169.000.

Benson, Glendon M. Thermally actuated heat pump. 4,249,378, Cl. 60-525.000.

Benyi, Alexander, Jr.; and Kozlin, Joseph R., to United Technologies Corporation. Preloaded engine inlet shroud. 4,249,859, Cl. 415-79.000.

Berger, Gerhard: *See—*
Haschka, Friedrich; and Berger, Gerhard, 4,250,236, Cl. 429-221.000.

Berler, Herbert. Garment composed of non-stretchable body portion entirely covered by loop fasteners and stretchable portions not so covered. 4,249,268, Cl. 2-115.000.

Berliet, Regis: *See*—
Pelletier, Jacques; and Berliet, Regis, 4,249,981, Cl. 156-441.000.
Berlin, Alfred A.: *See*—
Efimov, Alexei V.; Berlin, Alfred A.; Kefeli, Tamara Y.; Varlamova, Nina V.; Strongin, Grigory M.; Altshuler, Judif M.; and Kolomazov, Boris I., 4,250,322, Cl. 560-26.000.
Bernard, Claude R.; Daigne, Bernard; and Girard, Francois, to Office National d'Etudes et de Recherches Aerospatiales. Vacuo spark generator for the spectrographic analysis of samples. 4,250,433, Cl. 315-335.000.
Bernreiter, George P.: *See*—
Stegelitz, Wilhelmus J.; and Bernreiter, George P., 4,249,993, Cl. 162-381.000.
Bernstein, Joel E. Method of treating psoriasis of the nails and composition. 4,250,164, Cl. 424-61.000.
Bernstein, Lawrence A.: *See*—
Moe, Walter; Diker, Charles M.; and Bernstein, Lawrence A., 4,249,336, Cl. 46-17.000.
Berry, Clyde F. Steam turbine governor. 4,249,857, Cl. 415-36.000.
Berry, Clyde F. Turbine with freely rotatable rotor. 4,249,858, Cl. 415-64.000.
Berry, Richard C., to Crouse-Hinds Company. Fire barrier assembly for electrical cable. 4,249,353, Cl. 52-232.000.
Bertram, James L.; and Su Sheih, Pong, to Dow Chemical Company, The. Water-soluble epoxy resins and process for their preparation. 4,250,100, Cl. 260-348.140.
Best, Carl M. Motor-vehicle rear-seat head restraint. 4,249,754, Cl. 280-751.000.
Best, Gerd F.; and Weikert, Norbert B., to Krampe & Co. Fertigung in Bergbaubedarf GmbH. Rotating cutting drum having tapered and curved conveying surface. 4,249,779, Cl. 299-81.000.
Bethlehem Steel Corporation: *See*—
Schmitz, Norbert J., 4,249,997, Cl. 202-142.000.
BFG Glassgroup: *See*—
Baudin, Pol; Leger, Lucien; and Collignon, Pierre, 4,249,958, Cl. 136-251.000.
Bidwell, Robert E., to BioResearch Inc. Adjustable orthopedic foot splint. 4,249,523, Cl. 128-80.00A.
Bieberbach, George; Bongaards, Donald J.; Lohmeier, Alfred; and Duke, James M., to United States of America, Energy. Heat exchanger with leak detecting double wall tubes. 4,249,593, Cl. 165-70.000.
Biedell, Edward L.; and Ferb, Robert J., to Research-Cottrell, Inc. Sulfur dioxide scrubber with hyroclone separator. 4,250,152, Cl. 423-242.000.
Biener, Sig: *See*—
Roegner, George P.; Hawley, Richard; Steen, Howard; and Biener, Sig, 4,250,537, Cl. 362-86.000.
Biller, Efim. Process for the recovery of polyarylpolyamines. 4,250,114, Cl. 564-424.000.
Biondi, Renato: *See*—
Capello, Giuseppe; Giordano, Vittorio; and Biondi, Renato, 4,250,011, Cl. 204-224.00M.
BioResearch Inc.: *See*—
Bidwell, Robert E., 4,249,523, Cl. 128-80.00A.
Birchmore, Richard J.; Brookes, Robert F.; Copping, Leonard G.; and Wells, Wilfred H., to Boots Company Limited, The. Metal complex imidazole fungicides, and methods of controlling fungi with them. 4,250,179, Cl. 424-245.000.
Bissell, Lawrence E. Two-phase thermal energy conversion system. 4,249,385, Cl. 60-674.000.
Bitter, Johan G. A.; Maas, Rudolf J.; and Scheerman, Jacobus H., to Shell Oil Company. Preparation of 2,3,5-trimethylhydroquinone. 4,250,335, Cl. 568-771.000.
Bituma Stor, Inc.: *See*—
Dillman, Bruce A., 4,249,679, Cl. 222-542.000.
Bixby-Zimmer Engineering Co.: *See*—
Dryden, Joseph L., 4,250,038, Cl. 210-409.000.
Bizerba-Werke Wilhelm Kraut KG: *See*—
Kuhnle, Ernst, 4,249,624, Cl. 177-211.000.
Black & Decker Inc.: *See*—
Fittery, Larry R., 4,249,442, Cl. 83-473.000.
Secoura, Ralph J.; and Howard, Thomas J., Jr., 4,249,310, Cl. 30-276.000.
Blahut, Donald E.; Copp, David H.; and Stanzione, Daniel C., to Bell Telephone Laboratories, Incorporated. Data processing apparatus providing autoloading of memory pointer registers. 4,250,545, Cl. 364-200.000.
Blakeslee, Gerald A., to Lawson, William J. Method and apparatus for extracting clam bellies. 4,249,283, Cl. 17-51.000.
Blanchard, John C.: *See*—
Kouchich, Allan V.; Radosevich, Lawrence D.; Blanchard, John C.; and Thomas, Neal F., 4,250,482, Cl. 338-275.000.
Blaschke, Felix, to Siemens Aktiengesellschaft. Coordinate converter for changing polar vector variable into Cartesian vector variables. 4,250,559, Cl. 364-815.000.
Blau, Robert E. Adjustable head for tripods. 4,249,817, Cl. 354-293.000.
Bleisteiner, Manfred: *See*—
Wielinger, Hans; Rittersdorf, Walter; Bleisteiner, Manfred; Zimmermann, Gerd; Werner, Wolfgang; and Vomel, Wolfgang, 4,250,256, Cl. 435-32.000.
Bloodworth, Greville G.; and Manley, Martin H., to General Electric Company Limited, The. Magnetic field sensor semiconductor devices. 4,250,518, Cl. 357-27.000.
Blum, Herbert; and Austin, Kevin B., to Blum, Herbert. System for ordered measurement and computation. 4,250,554, Cl. 364-560.000.
Bochis, Richard J.; Kulsa, Peter; and Tolman, Richard L., to Merck & Co., Inc. 3-Substituted imidazo [1,2-A] pyridines. 4,250,174, Cl. 424-248.500.
Bockstie, Lawrence G., Jr., to Corning Glass Works. Fast curing coating composition. 4,250,276, Cl. 525-263.000.
Bode, Rudolf; Reisert, Arthur; Turk, Gunter; and Strack, Hans, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Thermoplastic mixtures for the production of synthetic resin films with antiblocking properties comprising a thermoplastic synthetic resin and a pulverulent zeolite. 4,250,081, Cl. 260-42.460.
Boehringer Ingelheim GmbH: *See*—
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Hoefke, Wolfgang; Gaida, Wolfram; and Pichler, Ludwig, 4,250,186, Cl. 424-273.00R.
Boehringer Mannheim GmbH: *See*—
Wielinger, Hans; Rittersdorf, Walter; Bleisteiner, Manfred; Zimmermann, Gerd; Werner, Wolfgang; and Vomel, Wolfgang, 4,250,256, Cl. 435-32.000.
Boeing Company, The: *See*—
Vatne, Rolf S.; and Woodmansee, Wayne E., 4,250,103, Cl. 250-402.000.
Wilson, Paul H., 4,249,974, Cl. 156-85.000.
Boger, Manfred: *See*—
Drabek, Jozef; and Boger, Manfred, 4,250,190, Cl. 424-298.000.
Bohm, Georg G. A.; Hamed, Gary R.; and Vescelius, Lee E., to Firestone Tire & Rubber Company, The. Thermoplastic elastomer blends. 4,250,273, Cl. 525-99.000.
Bolton, Joseph A.; and Huhtala, Olavi A., to Albany International Corp. Fabric washing system. 4,249,399, Cl. 68-20.000.
Bonazza, Benedict R.: *See*—
Holtz, Hans D., deceased; and Bonazza, Benedict R., 4,249,912, Cl. 44-71.000.
Boney, Joel F.; Musa, Fuad H.; and Ritter, Terry F., to Motorola, Inc. Fast interrupt method. 4,250,546, Cl. 364-200.000.
Bongaards, Donald J.: *See*—
Bieberbach, George; Bongaards, Donald J.; Lohmeier, Alfred; and Duke, James M., 4,249,593, Cl. 165-70.000.
Boots Company Limited, The: *See*—
Birchmore, Richard J.; Brookes, Robert F.; Copping, Leonard G.; and Wells, Wilfred H., 4,250,179, Cl. 424-245.000.
Borden, Inc.: *See*—
Golden, Ronald; Kulaga, Matthew S.; and Shatynski, Stephen, 4,250,076, Cl. 260-38.000.
Borg-Warner Corporation: *See*—
Donovan, Daniel L., 4,250,125, Cl. 261-41.00B.
Borror, Alan L.; and Hill, Ruth L., to Polaroid Corporation. Thiacyanine betaine blue sensitizing dyes. 4,250,244, Cl. 430-217.000.
Boser, Heinz; and Jelinek, Nikolaus, to AGFA-Gevaert, A.G. Arrangement for feeding sheets into a developing machine. 4,249,819, Cl. 354-312.000.
Boston University, The Trustees of: *See*—
Shapiro, Jerrold M., 4,249,825, Cl. 356-223.000.
Bott, Kaspar: *See*—
Ley, Gregor; Penzel, Erich; Rebafka, Walter; and Bott, Kaspar, 4,250,070, Cl. 260-29.6MM.
Bouillon, Claude; Vayssie, Charles; and Richard, Francoise, to L'Oreal. Process for preparing (2-oxo-3-bornylidene/methyl)-benzene sulfonic acids. 4,250,108, Cl. 260-511.000.
Bourgery, Guy R.: *See*—
Dostert, Philippe L.; Douzon, Colette A.; Bourgery, Guy R.; Gouret, Claude G.; Mocquet, Gisele C.; and Coston, Jean-Alain, 4,250,318, Cl. 548-229.000.
Bouvier, Julien J. Oil spill containment device for aquatic vessels. 4,249,834, Cl. 405-70.000.
Boyajian, Alfred Z. Bolt cutter. 4,249,308, Cl. 30-231.000.
Boyle, Carol J. Roller shade bracket for reversible shades. 4,249,714, Cl. 248-267.000.
Brachthauser, Kunibert; Ramesohl, Hubert; and Herchenbach, Horst, to Klockner-Humboldt-Deutz AG. Method and apparatus for the thermal treatment of pulverulent material particularly for the calcining of cement. 4,249,892, Cl. 432-14.000.
Brand, Vincent T.: *See*—
Sobel, Jay E.; and Brand, Vincent T., 4,250,131, Cl. 264-56.000.
Brandell, John R. Golf putting practice device. 4,249,739, Cl. 273-179.00A.
Brandenstein, Manfred: *See*—
Olschewski, Armin; Kunkel, Heinrich; Brandenstein, Manfred; and Walter, Lothar, 4,249,781, Cl. 308-8.200.
Brandli, Jacqueline: *See*—
Morris, Jeff; Brandli, Jacqueline; Lanza, Emmanuel; and Lingier, Willy F. R., 4,250,271, Cl. 525-66.000.
Brandt, Burkhard A.: *See*—
Bausch, James F.; Brandt, Burkhard A.; and Sanford, Craig A., 4,250,479, Cl. 336-208.000.
Brandt, Siegfried: *See*—
Gude, Fritz; and Brandt, Siegfried, 4,250,291, Cl. 528-338.000.
Branson Ultrasonics Corporation: *See*—
Obeda, Edward G., 4,249,986, Cl. 156-580.100.
Brassat, Bert: *See*—
Nielinger, Werner; Brassat, Bert; and Vernaleken, Hugo, 4,250,297, Cl. 528-340.000.
Bratt, Jan C.; Lorant, Stefan; and Pettersson, Kjell A. Temperature sensing device for a hot gas engine heater head. 4,249,377, Cl. 60-517.000.
Bratt, Richard L. Tennis racket exercise weight assembly. 4,249,728, Cl. 273-29.00A.

Brems, John H. Workpiece vertical conveyor system. 4,249,652, Cl. 198-796.000.

Brendl, Rudolf; Finkenzeller, Johann; and Weiss, Karl, to Siemens Aktiengesellschaft. Device for identifying x-ray films. 4,250,389, Cl. 250-476.000.

Brenner, Gerhard: *See—*
Behrendt, Bernhard; Brenner, Gerhard; Fischer, Heinz; and Leipelt, Rudolf, 4,249,500, Cl. 123-556.000.

Breslau, Steven M., to Pace Photographic Products, Inc. Method and apparatus for printing black borders on photo prints. 4,249,822, Cl. 355-74.000.

Bresson, Clarence R., to Phillips Petroleum Company. Copolymer-oil blends stabilized with asphalt. 4,250,067, Cl. 260-28.5AS.

Brico Engineering, Co., Ltd.: *See—*
Steel, Gordon H.; and Mitchell, Graham, 4,249,415, Cl. 73-120.000.

Bridges, Robert M., to Bendix Corporation, The. Cable construction. 4,250,351, Cl. 174-106.00R.

Briska, Marian; and Thiel, Klaus P., to International Business Machines Corporation. Method of boron doping silicon bodies. 4,249,970, Cl. 148-188.000.

Bristol-Myers Company: *See—*
Algieri, Aldo A.; and Crenshaw, Ronnie R., 4,250,316, Cl. 546-287.000.
Kawaguchi, Hiroshi; Konishi, Masataka; Tsuno, Takashi; and Miyaki, Takeo, 4,250,170, Cl. 424-181.000.

Britax Weathershields Limited: *See—*
Hunt, Keith R., 4,249,770, Cl. 296-218.000.

British Gas Corporation: *See—*
Banks, Reginald G. S.; and Williams, Alan, 4,250,060, Cl. 252-466.00J.

British Industrial Plastics, Limited: *See—*
Yates, Raymond W., 4,250,069, Cl. 260-29.40R.

British Petroleum Company Limited, The: *See—*
Foster, Alan I.; James, Peter G.; McCarroll, John J.; and Tennison, Stephen R., 4,250,057, Cl. 252-447.000.

British Sulphur Corp., Ltd.: *See—*
Zakiewicz, Bohdan M., 4,249,775, Cl. 299-4.000.

Brock, J. Donald, to Astec Industries, Inc. Self-erecting surge bin. 4,249,351, Cl. 52-64.000.

Brody, Philip S., to United States of America, Army. Photovoltaic-ferroelectric beam accessed memory. 4,250,567, Cl. 365-109.000.

Broghammer, Werner, to Dual Gebruder Steidinger. Switching device for cassette tape recorders. 4,250,527, Cl. 360-75.000.

Brokaw, Adrian P., to Analog Devices, Incorporated. Band-gap voltage reference with curvature correction. 4,250,445, Cl. 323-313.000.

Bromley, Eric, to Coleco Industries, Inc. Hand-held two-player electronic football game. 4,249,734, Cl. 273-94.000.

Bromley, Eric. Electronic simulated football game and method. 4,249,735, Cl. 273-94.000.

Bromley, Eric, to Coleco Industries, Inc. Two-player electronic sports action game. 4,249,744, Cl. 273-859.000.

Brookes, Robert F.: *See—*
Birchmore, Richard J.; Brookes, Robert F.; Copping, Leonard G.; and Wells, Wilfred H., 4,250,179, Cl. 424-245.000.

Brooks, Dannie L.; and Fields, Ronald S., to Reel-O-Matic Systems, Incorporated. Method and apparatus for dispensing flexible coiled materials from pallets. 4,249,705, Cl. 242-78.600.

Brossard, Guy: *See—*
Studievic, Claude; Brossard, Guy; and Yribarren, Philippe, 4,249,826, Cl. 356-244.000.

Brotzmann, Karl: *See—*
Knuppel, Helmut; Brotzmann, Karl; Fassbinder, Hans-Georg; and Fritz, Ernst, 4,249,719, Cl. 266-47.000.

Brown, Arthur K., to Bendix Corporation, The. Hydraulic brake booster reserve system. 4,249,452, Cl. 91-6.000.

Brown, Donald R.; Masopust, Otto T., Jr.; and Meal, John R., to Western Electric Company, Inc. Packaged electrical capacitor. 4,250,534, Cl. 361-272.000.

Brown, Frederick L.: *See—*
Broxterman, William E.; and Brown, Frederick L., 4,250,214, Cl. 428-514.000.

Brown Oil Tools, Inc.: *See—*
Bailey, Thomas F., 4,249,600, Cl. 166-77.000.

Brown, William L., Jr.: *See—*
Evans, Duane E.; Brown, William L., Jr.; and Johnson, Roger W., 4,249,382, Cl. 60-605.000.

Brownbill, Thomas D., to Metal Closures Group Limited. Capping machinery. 4,249,362, Cl. 53-490.000.

Browning, Richard J. Food slicing apparatus. 4,249,445, Cl. 83-762.000.

Broxterman, William E.; and Brown, Frederick L., to Dow Chemical Company, The. Wood-polymer composite containing a dicyclopentenyl acrylate or methacrylate polymer. 4,250,214, Cl. 428-514.000.

Bruder, Werner; and Merkle, Roland, to Daimler-Benz Aktiengesellschaft. Multi-cylinder internal combustion engine with a valve shut-off. 4,249,489, Cl. 123-90.160.

Brugmans, Johannes T.: *See—*
de Leeuw, Johannes A. N.; and Brugmans, Johannes T., 4,250,209, Cl. 427-250.000.

Brul, Jakob; and Riegger, Helena, to BBC Brown Boveri & Company Limited. Feed water preheater. 4,249,485, Cl. 122-441.000.

Brunswick Corporation: *See—*
Gilbertson, Gary G., 4,250,358, Cl. 200-52.00R.

Brust, Russell E. Timed water shut off system. 4,249,565, Cl. 137-495.000.

Bryan, Coleman J.; Wright, Edward E., Jr.; and Moyers, Clyde V., to United States of America, National Aeronautics and Space Administration. System for sterilizing objects. 4,250,143, Cl. 422-109.000.

Bucher, Bernard P.; Ancher, Jean-Francois R.; and Imbert, Thierry F., to Delalande S.A. Amides derived from carboxyl-5 pyrimidines. 4,250,178, Cl. 424-251.000.

Buckman Laboratories, Inc.: *See—*
Buckman, Robert H.; Hoekstra, Philip M.; and Pera, John D., 4,250,269, Cl. 525-6.000.

Buckman, Robert H.; Hoekstra, Philip M.; and Pera, John D., to Buckman Laboratories, Inc. Water-soluble mixtures of quaternary ammonium polymers, nonionic and/or cationic vinyl-addition polymers, and nonionic and/or cationic surfactants. 4,250,269, Cl. 525-6.000.

Budzich, Tadeusz. Load responsive fluid control valve. 4,249,569, Cl. 137-596.200.

Budzich, Tadeusz. Exhaust pressurization of load responsive system. 4,249,570, Cl. 137-596.130.

Budzyna, Edward S., to Rockwell International Corporation. Weft control device. 4,249,580, Cl. 139-450.000.

Buffard, Guy: *See—*
Level, Jean-Paul; and Buffard, Guy, 4,249,645, Cl. 188-322.000.

Buhr, Gerhard: *See—*
Sander, Jurgen; Buhr, Gerhard; and Ruckert, Hans, 4,250,247, Cl. 430-270.000.

Buijtendorp, Thomas M., to Van der Laken, Uitgeverij. Board for three player draughts and the like. 4,249,741, Cl. 273-261.000.

Buinicky, Ernest P.: *See—*
Estes, John H.; and Buinicky, Ernest P., 4,250,016, Cl. 208-11.0LE.

Bulakhov, Evgeny K.; and Fedyaev, Igor B. Method for controlling operating conditions of D.C. transmission line and control device for effecting same. 4,250,542, Cl. 363-35.000.

Buldini, Daniel A., to Polaroid Corporation. Cassette receiving apparatus for use with large format film processor. 4,249,818, Cl. 354-312.000.

Bura, Svetlana T.; and Nikitin, Jury I. Diamond paste. 4,249,347, Cl. 51-298.000.

Burgess, Carlton M.: *See—*
Schroeder, Lawrence E.; and Burgess, Carlton M., 4,249,517, Cl. 126-450.000.

Burk, Don: *See—*
Tutak, Peter; and Burk, Don, 4,249,596, Cl. 165-113.000.

Burk, Emmett H., Jr.: *See—*
Masologites, George P.; Sun, Jui-Yuan; Yoo, Jin S.; and Burk, Emmett H., Jr., 4,249,910, Cl. 44-1.0SR.

Burkett, Joe E. Roller and disc transmission. 4,249,430, Cl. 74-745.000.

Burkholder, Nelson D. Camera with means for allowing photography under low light conditions. 4,249,815, Cl. 354-241.000.

Burley, George J., to Firestone Tire & Rubber Company, The. Ply folding bladder. 4,249,979, Cl. 156-412.000.

Burnett, Joseph C., Jr.; and Heckle, William A., to Monsanto Company. Pretreatment of cathodes in electrohydrodimerization of acrylonitrile. 4,250,001, Cl. 204-73.00A.

Burnett, Mackenzie: *See—*
Harvey, Andrew C.; and Burnett, Mackenzie, 4,249,838, Cl. 406-51.000.

Burns, Daniel E., to Demco, Inc. Automatic liquid ice system. 4,249,388, Cl. 62-185.000.

Burns, Robert B., to Texaco Development Corporation. Deviated drilling apparatus. 4,249,619, Cl. 175-9.000.

Burns, Robert W.: *See—*
Stein, William W.; and Burns, Robert W., 4,250,511, Cl. 346-76.0PH.

Burroughs Wellcome Co.: *See—*
Carter, Stuart W.; and Skidmore, Peter R., 4,250,171, Cl. 424-189.000.
Gorvin, John H., 4,250,182, Cl. 424-257.000.

Burton, Robert S., III; and Chambers, Carlon C., to Occidental Oil Shale, Inc. Method of doping retort with a halogen source to determine the locus of a processing zone. 4,249,602, Cl. 166-251.000.

Buschmann, Ernst; Goetz, Norbert; Zeeh, Bernd; and Varwig, Juergen, to BASF Aktiengesellschaft. Substituted phenylpropyl halides. 4,250,123, Cl. 260-185.000.

Bush, Forest L., to Westinghouse Electric Corp. Combustion control system. 4,249,886, Cl. 431-90.000.

Butler, Walter J.; and Eichelberger, Charles W., to General Electric Company. Charge transfer analog-to-digital converter with precise charge control. 4,250,494, Cl. 340-347.0CC.

Butt, Alan G., to Trane Company, The. Plate type heat exchanger with bar means for flow control and structural support. 4,249,595, Cl. 165-110.000.

Buyanov, Alexei V.: *See—*
Mikhailov, Viktor V.; Karakovsky, Alexandr K.; Dyachenko, Petr Y.; Ivanov, Jury S.; Mikhailov, Igor V.; Lunin, Mikhail G.; Buyanov, Alexei V.; Konstantinov, Alexei A.; Shagurin, Anatoly S.; Kirillov, Alexandr P.; Mikhailov, Oleg V.; and Khaimov, Arkady S., 4,249,871, Cl. 425-111.000.

BYK Gulden Lomberg Chemische Fabrik GmbH: *See—*
Krastinat, Walter, 4,250,183, Cl. 424-263.000.

Byler, Thelma T.: *See—*
Byler, William H., 4,249,803, Cl. 351-46.000.

Byler, William H., to Byler, William H.; and Byler, Thelma T., Trustees of William H. Byler Revocable Trust. Optical device for pre-operative cataract patients. 4,249,803, Cl. 351-46.000.

Cableform Limited: *See—*
Morton, John; and Stevens, Keith D., 4,250,437, Cl. 318-357.000.

Cade, Phillip J., to Electronics Corporation of America. Burner control apparatus with stabilized pilot flame timing interval. 4,249,884, Cl. 431-31.000.

Cade, Richard L.: *See—*
Kiefer, Edward H.; Lysenko, George P.; and Cade, Richard L., 4,250,486, Cl. 340-52.00R.

Calderon, Reynaldo, to Texaco Inc. Method of assembling self-cleaning helical spring filter. 4,249,292, Cl. 29-163.5CW.

Callejas, Ricardo J., to Phillips Petroleum Company. Temperature control of exothermic reactions. 4,249,907, Cl. 23-230.00A.

Cameron, Robert G.: *See—*
Osborn, Harland J.; Cameron, Robert G.; and Walsh, Edward J., 4,250,251, Cl. 430-449.000.

Canada, Her Majesty the Queen in right of: *See—*
Davis, Bryce D., 4,250,455, Cl. 328-167.000.

Canadian Fram Limited: *See—*
Charles, Herbert N., 4,249,861, Cl. 416-132.00A.

Canon Kabushiki Kaisha: *See—*
Suzuki, Masayuki; Ito, Tadashi; Yamamichi, Masayoshi; and Murakami, Hiroyasu, 4,249,816, Cl. 354-266.000.

Cantello, Barrie C. C., to Beecham Group Limited. Heterocyclic compounds and pharmaceutical use. 4,250,173, Cl. 424-246.000.

Capello, Giuseppe; Giordano, Vittorio; and Biondi, Renato, to Centro Ricerche Fiat S.p.A. Electrode tool for electrochemical machining. 4,250,011, Cl. 204-224.00M.

Cardone, Michele; Grandini, Angelo; and Zaramella, Bruno, to Tecnomagnetica di Cardone, Grandini, Zaramella & C. S. a.s. Manually controlled magnetic lifting device. 4,250,478, Cl. 335-288.000.

Carey, Van P., to General Motors Corporation. Plate type heat exchanger. 4,249,597, Cl. 165-166.000.

Carl Zeiss-Stiftung: *See—*
Muchel, Franz; and Summerer, Gunther, 4,249,802, Cl. 351-7.000.

Carleton, G. Robert, to PPG Industries, Inc. Gas hearth bed with grooved exit portion. 4,249,928, Cl. 65-182.200.

Carlin, William W., to PPG Industries, Inc. Method of depositing a catalyst to form a solid polymer electrolyte membrane. 4,250,013, Cl. 204-282.000.

Carlo, Dennis J.; Hagopian, Arpi; and Kniskern, Peter J., to Merck & Co., Inc. Method of obtaining an antigenic fraction from *Bordetella bronchiseptica*. 4,250,265, Cl. 435-272.000.

Carpenter, Larry D.: *See—*
Miles, Ronald C.; and Carpenter, Larry D., 4,250,004, Cl. 204-98.000.

Carrier, Roger, to Bain Ultra Quebec Inc. Hydromassage apparatus. 4,249,522, Cl. 128-66.000.

Carter, Stuart W.; and Skidmore, Peter R., to Burroughs Wellcome Co. Pest control. 4,250,171, Cl. 424-189.000.

Carter, Walter H., to Texaco Inc. Polymer-containing fluid and an oil recovery method using the fluid. 4,249,608, Cl. 166-275.000.

Cartwright, John R., to Data Recording Instrument Company Limited. Methods for manufacturing magnetic transducing heads. 4,249,301, Cl. 29-603.000.

Case Western Reserve University: *See—*
Ko, Wen H.; Fleming, David G.; Derda, Harry J.; and Martin, William O., 4,249,527, Cl. 128-204.180.

Cases, Jean M.; Valence, Georges; and Lietard, Olivier, to Agence Nationale de Valorisation de la Recherche (ANVAR). Method for recovering the lead and zinc values in secondary scrubber muds from blast furnace gases. 4,250,027, Cl. 209-233.000.

Cassella Aktiengesellschaft: *See—*
Dorries, Peter; Piesch, Steffen; and Wolf, Alfons, 4,250,282, Cl. 525-509.000.
Weckler, Gerhard; Hauss, Hans J.; Hintermeier, Karl; and Engelhardt, Friedrich, 4,250,296, Cl. 528-295.000.

Cassidy, Harry E. Wave rod. 4,249,550, Cl. 132-41.00R.

Castanino, Joseph J. Bubble-blowing device. 4,249,335, Cl. 46-6.000.

Castelbaum, Leonard: *See—*
Yap, Crescencio T.; and Castelbaum, Leonard, 4,249,971, Cl. 156-143.000.

Caswell, Bruce F., to Arcanum Corporation. Treatment of cement copper. 4,249,905, Cl. 23-313.00R.

Caterpillar Tractor Co.: *See—*
Denning, Ralph E., 4,249,429, Cl. 74-711.000.
Evans, Duane E.; Brown, William L., Jr.; and Johnson, Roger W., 4,249,382, Cl. 60-605.000.
Habiger, Cyril W., 4,249,557, Cl. 137-112.000.
Merkel, Russell D., 4,249,326, Cl. 37-141.00T.

Caunt, Anthony D.; and Jaggard, James F. R., to Imperial Chemical Industries Limited. Titanium trihalide composition. 4,250,283, Cl. 526-77.000.

Causton, Robert J.; and Richardson, Joseph, to Davy-Loewy Limited. Sieving device for magnetically susceptible particles. 4,250,025, Cl. 209-38.000.

Celler, George K., to Western Electric Company, Inc. Method of removing contaminating impurities from device areas in a semiconductor wafer. 4,249,962, Cl. 148-1.500.

Centro Ricerche Fiat S.p.A.: *See—*
Capello, Giuseppe; Giordano, Vittorio; and Biondi, Renato, 4,250,011, Cl. 204-224.00M.
Rivetti, Enrico; and Audisio, Filippo, 4,249,512, Cl. 126-435.000.

Cerwin, Robert J.; and Yolinsky, Robert H., to Ethicon, Inc. Suture package. 4,249,656, Cl. 206-63.300.

Ceserani, Roberto: *See—*
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Alessandro; Fumagalli, Angelo; Faustini, Franco; Ceserani, Roberto; and Usardi, Maria M., 4,250,188, Cl. 424-285.000.

Chaconas, Charles G.: *See—*
Lee, Ronald L.; and Chaconas, Charles G., 4,249,537, Cl. 128-422.000.

Chambers, Carlon C.: *See—*
Burton, Robert S., III; and Chambers, Carlon C., 4,249,602, Cl. 166-251.000.

Chambers, Robert B., to Power-D, Inc. Rotary internal combustion engine. 4,249,487, Cl. 123-44.00C.

Champion International Corporation: *See—*
Chang, John, 4,250,098, Cl. 260-335.000.

Chandler, Herman, to GAF Corporation. Plastic formulation reinforced with organic fibers. 4,250,064, Cl. 260-17.4CL.

Chang, Andrew K.: *See—*
Wiederrich, James L.; Chang, Andrew K.; and Muray, Julius J., 4,249,824, Cl. 356-155.000.

Chang, John, to Champion International Corporation. Chromogenic compounds. 4,250,098, Cl. 260-335.000.

Chang, Leroy L.: *See—*
Esaki, Leo; Tsu, Raphael; Sai-Halasz, George A.; and Chang, Leroy L., 4,250,515, Cl. 357-16.000.

Chang, Zung F.; and Minton, Robert, to RCA Corporation. Push-push resonant power inverter. 4,250,541, Cl. 363-28.000.

Chapman, James; and Ratz, James W., to Honeywell Inc. Servo apparatus with electrical motion limiting. 4,250,441, Cl. 318-626.000.

Charles, Herbert N., to Canadian Fram Limited. Fan blade reinforcement plate. 4,249,861, Cl. 416-132.00A.

Charvin, Roger; and Pignan, Jean-Louis, to Produits Chimiques Ugine Kuhlmann. Process for the electrolytic preparation of alkali metal chlorates. 4,250,003, Cl. 204-098.000.

Chase, Richard A.; Williams, D. Michael; and Simpson, Danny E., to Johnson & Johnson. Infant development ring toy. 4,249,333, Cl. 46-1.00R.

Chatfield, Douglas E.: *See—*
Anderson, Earl R.; and Johnson, Lee E., 4,249,355, Cl. 52-593.000.

Chem Systems Inc.: *See—*
Sherwin, Martin B.; Peress, Jimmy Y.; and Gwozdz, Kenneth J., 4,250,344, Cl. 585-437.000.

Chemetals Corporation: *See—*
Welsh, Jay Y., 4,250,149, Cl. 423-50.000.

Chemical Research & Licensing Company: *See—*
Smith, Lawrence A., Jr., 4,250,052, Cl. 252-426.000.

Chemische Werke Huls Aktiengesellschaft: *See—*
Kaufhold, Manfred; and Jacquemin, Werner, 4,250,343, Cl. 568-903.000.
Scharf, Helmut; Franz, Gerhard; and Hokele, Gunther, 4,250,119, Cl. 568-389.000.
Sommer, Neithart; Nordsiek, Karl-Heinz; and Ehrlich, Jurgen, 4,250,082, Cl. 260-42.550.
zur Hausen, Manfred; Kaufhold, Manfred; and Lange, Erhard, 4,250,337, Cl. 568-853.000.

Chen, Sow-Mei L.: *See—*
Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-Mei L., 4,250,325, Cl. 560-121.000.

Cheney, Roland J.; and Owen, Calvin P., to Cheney, Roland J. Board and apparatus for simultaneously playing chess games. 4,249,740, Cl. 273-260.000.

Cherukuri, Subraman R.; and Friello, Dominick R., to Life Savers, Inc. Method for applying soft flexible sugar coating to fresh chewing gum and coated chewing gum product. 4,250,195, Cl. 426-5.000.

Chesnel, Yvonnick P.: *See—*
Pruvot, Francois D.; and Chesnel, Yvonnick P., 4,249,431, Cl. 74-785.000.

Chevallier, Rene G., to Odev S.A. Programmed-sequence fluid distributor for use in feed and maintenance of detergent concentration in the washing bath of a dish-washing machine or the like. 4,249,573, Cl. 137-624.200.

Chiang, Shang-Yi: *See—*
Liu, Yet-Zen; and Chiang, Shang-Yi, 4,249,967, Cl. 148-171.000.

Chicago Lock Co.: *See—*
Steinbach, Robert L., 4,249,402, Cl. 70-68.000.

Chien, Calvin C.: *See—*
Shuck, David L.; and Chien, Calvin C., 4,249,776, Cl. 299-4.000.

Chioffe, Joseph J. Medical pendant. 4,249,330, Cl. 40-363.000.

Chojnacki, Dennis A.: *See—*
Mayers, Richard R.; Huebner, Steven R.; and Chojnacki, Dennis A., 4,249,893, Cl. 432-49.000.

Christenson, Christopher P.; McNamee, Gary M.; and Delaune, Ralph H., to Dow Chemical Company, The. Method of disposing of spent organic complexing solutions containing cuprous halides. 4,249,939, Cl. 75-109.000.

Christenson, Larry E.; Dripps, Rick W.; Gillette, John E.; and Mittleberg, Mark S. Ventilating system for a livestock building. 4,249,461, Cl. 98-38.00R.

Christiansen, Keith W.: *See—*
Reichenbach, Jerry D.; and Christiansen, Keith W., 4,249,874, Cl. 425-127.000.

Christie, Howard W.; and Hodge, Walter D., to H. C. Price Co. Apparatus for use in coating longitudinally welded pipe. 4,249,477, Cl. 118-/413.000.

Christy, Ronald I.; and Anderson, Martin L. Lead chopper. 4,249,312, Cl. 30-315.000.

Chu, Chin-Chiun, to Mobil Oil Corporation. Selective production of para-xylene. 4,250,345, Cl. 585-467.000.

Chun Zu Machinery Ind. Co., Ltd.: *See—*
Lee, Shi-Chung, 4,249,444, Cl. 83-588.000.

Ciambra, Frank P. Earring or similar article. 4,249,393, Cl. 63-12.000.

Ciba-Geigy AG: *See*—
Tzikas, Athanassios, 4,250,102, Cl. 260-377.000.
Ciba-Geigy Corporation: *See*—
Babler, Fridolin, 4,250,079, Cl. 260-42.210.
Drabek, Jozef; and Boger, Manfred, 4,250,190, Cl. 424-298.000.
Kvita, Vratislav; Zweifel, Hans; and Greber, Gerd, 4,250,096, Cl. 260-326.00N.
Meyer, Hans R.; and Weber, Kurt, 4,250,317, Cl. 548-327.000.
Rody, Jean; and Rasberger, Michael, 4,250,268, Cl. 525-100.000.
Sallmann, Alfred; and Baschang, Gerhard, 4,250,192, Cl. 424-309.000.
Ciment, Lawrence M.: *See*—
Nestor, Jack; Ciment, Lawrence M.; and Rotbart, Abraham, 4,249,529, Cl. 128-207.170.
Citizen Watch Company Limited: *See*—
Ebihara, Heihachiro; Sekiya, Fukuo; and Yamada, Takashi, 4,250,571, Cl. 368-10.000.
Masubuchi, Sadao, 4,249,801, Cl. 350-346.000.
Masuda, Katsuya; and Saitou, Asao, 4,250,421, Cl. 310-156.000.
Yoshida, Masaru, 4,250,572, Cl. 368-71.000.
Clarion Co., Ltd.: *See*—
Tomizawa, Akimori, 4,250,524, Cl. 358-122.000.
Clark, Richard E.: *See*—
Pocock, John F. E.; Krishnakumar, Suppayan M.; Mahajan, Gautam K.; and Clark, Richard E., 4,249,667, Cl. 215-1.00C.
Claude, Bruno; and Le Fustec, Richard, to Compagnie Francaise de Raffinage. Micron size polymeric coating and related methods. 4,250,227, Cl. 428-461.000.
Clay, Bobby J., to Natmar, Inc. Machine and method for removing a label sewn to a workpiece. 4,249,436, Cl. 83-22.000.
Click, Gaylon T.; Turner, Nathan L.; and Hoff, Edwin F., Jr., to Denka Chemical Corporation. Viscosity stabilized chloroprene-sulfur copolymers. 4,250,083, Cl. 260-45.9QB.
Clifford, Jimmie D.; Girsch, David E.; and Magruder, Michael K., to Deere & Company. Bypass valve. 4,249,558, Cl. 137-115.000.
Clorox Company, The: *See*—
Foley, Lary L., 4,250,165, Cl. 424-76.000.
Cochran, Johnnie J.: *See*—
Iwer, Herbert W.; and Cochran, Johnnie J., 4,250,462, Cl. 330-296.000.
Cocker, Jr., deceased; Geroge T.: *See*—
Ewins, Earle E., Jr.; and Cocker, Jr., deceased; Geroge T., 4,250,272, Cl. 525-89.000.
Colburn, Michael R., to Telles, Larry, a part interest. Oil filter removing tool and method. 4,249,296, Cl. 29-426.100.
Coleco Industries, Inc.: *See*—
Bromley, Eric, 4,249,734, Cl. 273-94.000.
Bromley, Eric, 4,249,744, Cl. 273-859.000.
Coleman Company, Inc., The: *See*—
Conley, James R., 4,249,760, Cl. 292-197.000.
Colinet, Andre; Schwartz, Christian; and Francois, Jean-Pierre, to Regie Nationale des Usines Renault. Manipulating arrangement with multiple functions, particularly for the air-conditioning of vehicles. 4,249,427, Cl. 74-471.00R.
Coll-Palagos, Miguel: *See*—
Kuck, Mark A.; Miller, Gary K.; and Coll-Palagos, Miguel, 4,250,000, Cl. 204-59.0QM.
Collagen Corporation: *See*—
Luck, Edward E.; and Daniels, John R., 4,250,139, Cl. 422-21.000.
Collier, Leroy. Mobile lift cart. 4,249,749, Cl. 280-35.000.
Collignon, Pierre: *See*—
Baudin, Pol; Leger, Lucien; and Collignon, Pierre, 4,249,958, Cl. 136-251.000.
Collins, Gerald W., to Harris Corporation. Circularly polarized zigzag antenna. 4,250,509, Cl. 343-806.000.
Cominco Ltd.: *See*—
Kuit, Wouterus J. M.; and Babcock, Alan R., 4,250,030, Cl. 210-684.000.
Commissariat a l'Energie Atomique: *See*—
de Nucheze, Louis; and Robin, Marcel, 4,249,484, Cl. 122-32.000.
Dolle, Lucien, 4,249,994, Cl. 176-37.000.
Jogand, Patrick, 4,249,995, Cl. 176-65.000.
Communications Satellite Corporation: *See*—
Szarvas, George G., 4,250,470, Cl. 333-14.000.
Comolli, Alfred G., to Hydrocarbon Research, Inc. Drying and passivating wet coals and lignite. 4,249,909, Cl. 44-1.00G.
Compagnie Francaise de Raffinage: *See*—
Claude, Bruno; and Le Fustec, Richard, 4,250,227, Cl. 428-461.000.
Compagnie Generale de Radiologie: *See*—
Gabbay, Emile; Tran Quand, Dang; and Lafitte, Andre, 4,250,425, Cl. 313-60.000.
Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines: *See*—
Lamy, Jacques E., 4,249,618, Cl. 175-9.000.
Composite Technology Corporation: *See*—
Rex, Gary C., 4,250,136, Cl. 264-257.000.
Computer Gesellschaft Konstanz mbH: *See*—
Haupt, Gerhard, 4,250,488, Cl. 340-146.3AG.
Concast AG: *See*—
Willim, Fritz, 4,249,590, Cl. 164-82.000.
Concorde Manufacturing Company: *See*—
Hancherick, Kenneth J., 4,249,737, Cl. 273-143.00R.
Condo, Antonino: *See*—
Papa, Sisto S.; and Condo, Antonino, 4,250,091, Cl. 260-160.000.
Condolios, Elie, to Alsthom-Atlantique. Apparatus for maintaining solids in a suspension and a method of using it. 4,249,828, Cl. 366-102.000.
Confon AG: *See*—
Halm, Hans, 4,249,662, Cl. 209-610.000.
Conley, James R., to Coleman Company, Inc., The. Latch assembly. 4,249,760, Cl. 292-197.000.
Connecticut Research Institute, Inc.: *See*—
Warren, John B.; and Kundrath, Michael R., 4,250,127, Cl. 264-22.000.
Connolly, John R.; Gibson, David E.; Heimark, Edward L.; Quinn, Jerome B.; Speechley, Richard E.; and Winter, Richard L., to Philadelphia Gear Corporation. Surface aerator impeller. 4,249,863, Cl. 416-185.000.
Conoco, Inc.: *See*—
McClaflin, Gifford G., 4,249,554, Cl. 137-13.000.
Consolidated Fiberglass Products Co.: *See*—
Pfeffer, John R., 4,250,221, Cl. 428-284.000.
Consolidated Papers, Inc.: *See*—
Damrau, Wayne A.; and Gauss, James C., 4,250,211, Cl. 427-356.000.
Constant, Georges; Haran, Raymond; Lebugle, Albert; Zaouk, Aref; Morancho, Roland; and Pouvreau, Philippe, to Agence Nationale de Valorisation de la Recherche (ANVAR). Process for depositing a III–V semi-conductor layer on a substrate. 4,250,205, Cl. 427-87.000.
Container Corporation of America: *See*—
Gardner, Jeffrey M., 4,249,691, Cl. 229-15.000.
Held, Louis E., Jr., 4,249,690, Cl. 229-5.500.
Continental Group, Inc., The: *See*—
Pocock, John F. E.; Krishnakumar, Suppayan M.; Mahajan, Gautam K.; and Clark, Richard E., 4,249,667, Cl. 215-1.00C.
Cook, Edward H., Jr.: *See*—
Lazarz, Christine A.; Cook, Edward H., Jr.; and Schulz, Arthur C., 4,250,002, Cl. 204-98.000.
Cook, Francis E., to Dearborn Rubber Company. Belt type expansion joints. 4,250,223, Cl. 428-285.000.
Cookson, Alan H., to Westinghouse Electric Corp. Circuit interrupter utilizing a closing resistance. 4,250,362, Cl. 200-144.0AP.
Coon, Clifford L.; and Simon, Robert L., to Baxter Travenol Laboratories, Inc. Method of synthesizing fluoromethylhexafluoroisopropyl ether. 4,250,334, Cl. 568-683.000.
Cooper, David; and Davidson, Philip J., to Marconi Company, Limited, The. Filter for converting pulse width modulation to amplitude modulation. 4,250,469, Cl. 332-1.000.
Copes-Vulcan: *See*—
Schnall, Ira H.; and Mott, Walter W., 4,249,574, Cl. 137-625.300.
Copley, Russell D.: *See*—
Hubbard, Arthur L.; Copley, Russell D.; and Nieman, Merle D., 4,249,365, Cl. 56-13.200.
Copp, David H.: *See*—
Blahut, Donald E.; Copp, David H.; and Stanzione, Daniel C., 4,250,545, Cl. 364-200.000.
Copping, Leonard G.: *See*—
Birchmore, Richard J.; Brookes, Robert F.; Copping, Leonard G.; and Wells, Wilfred H., 4,250,179, Cl. 424-245.000.
Cordes, Claus: *See*—
Denzinger, Walter; and Cordes, Claus, 4,250,289, Cl. 526-201.000.
Cordless Power Corporation: *See*—
Slagle, Glenn B., 4,250,451, Cl. 324-239.000.
Corning Glass Works: *See*—
Bockstie, Lawrence G., Jr., 4,250,276, Cl. 525-263.000.
Danielson, Paul S., 4,249,946, Cl. 106-54.000.
Cornou, Jean, to Allibert Exploitation, Societe Anonyme. Synthetic-resin road marker and method of molding same. 4,249,357, Cl. 52-728.000.
Corrado, Giovanni; and Sopino, Bruno, to SNIA VISCOSA Societa Nazionale Industria Applicazioni Viscosa S.p.A. Unsaturated polyester resins containing an additive of the formula R—OH which are not inhibited by the oxygen of the air and process for making the same. 4,250,295, Cl. 528-272.000.
Corse, Louis G., to Machines Chambon. Method and installation for drying moulded pulverulent products. 4,249,316, Cl. 34-28.000.
Cosden Technology, Inc.: *See*—
Hart, Edward; and Rutledge, Raleigh N., 4,249,875, Cl. 425-133.100.
Morris, Jeff; Brandli, Jacqueline; Lanza, Emmanuel; and Lingier, Willy F. R., 4,250,271, Cl. 525-66.000.
Cosimini, Gregory J.; Johnson, Leslie H.; Lo, David S.; Nelson, George F.; and Paul, Maynard C., to Sperry Corporation. Symmetrical memory plane for cross-tie wall memory system. 4,250,565, Cl. 365-87.000.
Costa, Giuseppe, to Eurallumina S.p.A. Process for the disposal of bauxite processing wastes and their containment into filling basins. 4,250,032, Cl. 423-121.000.
Costantini, Giuseppe; Serafini, Mauro; and Paoli, Pietro, to Montedison S.p.A. Process for the recovery of the solvent and of the by-produced methylacetate in the synthesis of terephthalic acid. 4,250,330, Cl. 562-409.000.
Coston, Jean-Alain: *See*—
Dostert, Philippe L.; Douzon, Colette A.; Bourgery, Guy R.; Gouret, Claude G.; Mocquet, Gisele C.; and Coston, Jean-Alain, 4,250,318, Cl. 548-229.000.
Cota, Marlo E.; and Gurtler, Richard W., to Motorola, Inc. Apparatus and method for producing polycrystalline ribbon. 4,250,148, Cl. 422-246.000.

Coulter Electronics, Inc.: *See*—
Armstrong, Douglas, 4,250,051, Cl. 252-408.000.

Coupland, Keith; and Smith, Clinton R., to Exxon Research & Engineering Co. Polymerized fatty acid amine derivatives useful as friction and wear-reducing additives. 4,250,045, Cl. 252-32.70E.

Cowley, Gerald, to ERCO Industries Limited. Small scale chlorine dioxide plant. 4,250,159, Cl. 423-480.000.

Cox, James D., Jr. Portable one-hand operated rotary torque producing tool. 4,249,617, Cl. 173-170.000.

Cozzi, John F.; and Maczko, Edward M., Jr., to Wire Cloth Products, Inc. Transmission filter. 4,250,039, Cl. 210-416.500.

CR Industries: *See*—
Reichenbach, Jerry D.; and Christiansen, Keith W., 4,249,874, Cl. 425-127.000.

Crado Devices Limited: *See*—
Craske, William J., 4,249,469, Cl. 109-59.00R.

Crago, Terril M.; and Olsen, Frederick C., to Standun, Inc. Die press having selectively variable die access clearance. 4,249,410, Cl. 72-347.000.

Crain, Philip W.; Kelley, William J.; and Shoff, Daniel J., to Mattel, Inc. Space toy. 4,249,339, Cl. 46-232.000.

Cramm, Gunther: *See*—
Lehmann, Wolfgang; Muller, Friedhelm; Lobach, Wilfried; Cramm, Gunther; and Hammerstrom, Knut, 4,250,298, Cl. 528-342.000.
Lehmann, Wolfgang; Muller, Friedhelm; Cramm, Gunther; Hammerstrom, Knut; and Lobach, Wilfried, 4,250,299, Cl. 528-342.000.

Craske, William J., to Crado Devices Limited. Safe having combination locking mechanisms. 4,249,469, Cl. 109-59.00R.

Crawford, Horace R. Cold sore treatment method. 4,250,168, Cl. 424-127.000.

CRC Compagnia di Ricerca Chimica S.A.: *See*—
Kajfez, Franjo, 4,250,092, Cl. 260-239.00E.

Crenshaw, Ronnie R.: *See*—
Algieri, Aldo A.; and Crenshaw, Ronnie R., 4,250,316, Cl. 546-287.000.

Crepeau, Philip C., to NCR Corporation. Multilayer printed circuit board. 4,249,302, Cl. 29-830.000.

Crivello, James V., to General Electric Company. P, As, and Sb hexafluoride onium salts as photoinitiators. 4,250,311, Cl 546-9.000.

Croda Synthetic Chemicals Limited: *See*—
McMahon, Philip J.; and Yates, Frank S., 4,250,340, Cl. 568-639.000.

Crolli, Gary M., to Rehrig Pacific Company. Carrying case. 4,249,671, Cl. 220-469.000.

Crosby, Jeffrey N.; and Hanley, Robert S., to International Nickel Co., Inc., The. Chemical vapor deposition. 4,250,210, Cl. 427-252.000.

Crouse-Hinds Company: *See*—
Berry, Richard C., 4,249,353, Cl. 52-232.000.

Crouzet: *See*—
Battarel, Claude, 4,250,566, Cl. 365-88.000.

Crowley, Ralph P., to Phillips Petroleum Company. Refrigeration of liquefied petroleum gas storage with retention of light ends. 4,249,387, Cl. 62-54.000.

Crucible Inc.: *See*—
Haswell, Walter T.; and Kasak, August, 4,249,945, Cl. 75-241.000.

Cubic Corporation: *See*—
McNaul, William F., 4,250,506, Cl. 343-100.0CS.

Culler, Virgil H.: *See*—
United States of America, National Aeronautics and Space Administration; Feldstein, Cyril; Lewis, Gilbert W.; Culler, Virgil H.; and Merrbaum, Samuel, 4,249,417, Cl. 73-141.00A.

Cummins Engine Company, Inc.: *See*—
Perr, Julius P., 4,249,499, Cl. 123-502.000.

Cunningham, Donald F., to Springhurst Technologies Corp. Windmill having counterbalancing mechanism. 4,249,867, Cl. 417-334.000.

Cuomo, Jerome J.; Gambino, Richard J.; Harper, James M.; and Kupstis, John D., to International Business Machines Corporation. Energetic particle beam deposition system. 4,250,009, Cl. 204-192.00N.

Cusenza, John, to Sebastian International Inc. Root perm rod. 4,249,549, Cl. 132-36.00C.

Cushman Industries, Incorporated: *See*—
Pruden, Samuel H., 4,249,459, Cl. 92-106.000.

Custom Research and Development: *See*—
Leveskis, Newton G., 4,250,048, Cl. 252-142.000.

CX Corporation: *See*—
Hewlett, Malcolm L., 4,249,663, Cl. 209-705.000.

Cycles Peugeot: *See*—
Lacroix, Bernard, 4,249,751, Cl. 280-289.00L.

Cyr, Robert. Wire or cable bending apparatus. 4,249,405, Cl. 72-34.000.

Cytron, Inc.: *See*—
Keller, Harold A.; and Glover, Clinton G., 4,249,508, Cl. 124-80.000.

Czank, Stanislaw: *See*—
Bambuch, Tadeusz; Wilusz, Henryk; Englert, Wieslaw; Czank, Stanislaw; and Surmiak, Stanislaw, 4,249,964, Cl. 148-16.500.

Czombos, Jozsef: *See*—
Felfoldi, Karoly; Apjok, Jozsef; Bartok, Mihaly; Czombos, Jozsef; Molnar, Arpad; Noteisz, Ferenc; Karpati, Egon; and Szporny, Laszlo, 4,250,310, Cl. 544-379.000.

D S B Valves Limited: *See*—
Deane, Moray P., 4,249,566, Cl. 137-498.000.

Dahlke, Charles J., to Rosemount Inc. Two wire transmitter for converting a varying signal from a remote reactance sensor to a DC current signal. 4,250,490, Cl. 340-87C.370.

Daigne, Bernard: *See*—
Bernard, Claude R.; Daigne, Bernard; and Girard, Francois, 4,250,433, Cl. 315-335.000.

Daikin Kogyo Co., Ltd.: *See*—
Saegusa, Takeo; Yamada, Akira; Iwase, Masaaki; and Iwatani, Akitoshi, 4,250,300, Cl. 528-401.000.
Suzuki, Takeshi; Furukawa, Yasuyoshi; Tomoda, Masayasu; Ueta, Yutaka; and Ohmori, Akira, 4,250,278, Cl. 525-340.000.

Daimler-Benz Aktiengesellschaft: *See*—
Bruder, Werner; and Merkle, Roland, 4,249,489, Cl. 123-90.160.
Luckel, Joachim; and Povel, Rolf, 4,249,456, Cl. 91-433.000.
Mehren, Herbert, 4,249,780, Cl. 303-115.000.

Daleo, Joseph, to Triple Cuff Corporation. Multiple handcuff arrangement. 4,249,401, Cl. 70-16.000.

Damico, Dennis J.; and Pascarella, Vincent J., to Lord Corporation. Low temperature activating adhesives for laminating plastic films to metal. 4,250,274, Cl. 525-127.000.

Damrau, Wayne A.; and Gauss, James C., to Consolidated Papers, Inc. Paper coating method and apparatus. 4,250,211, Cl. 427-356.000.

Daniels, John R.: *See*—
Luck, Edward E.; and Daniels, John R., 4,250,139, Cl. 422-21.000.

Daniels, Michael G., to Westinghouse Electric Corp. Voltmeter apparatus for cascaded transformers. 4,250,448, Cl. 324-127.000.

Danielson, Paul S., to Corning Glass Works. Detergent-durable glasses. 4,249,946, Cl. 106-54.000.

Dannelly, Clarence C., to Eastman Kodak Company. Seed coatings. 4,249,343, Cl. 47-57.600.

Darwent, Richard H.; Phillips, George R.; and Karol, Herman S., to Westinghouse Electric Corp. Corner post platform assembly. 4,249,640, Cl. 187-1.00R.

Data Recording Instrument Company Limited: *See*—
Cartwright, John R., 4,249,301, Cl. 29-603.000.

Daud, Taher: *See*—
United States of America, National Aeronautics and Space Administration; Koliwad, Krishna M.; and Daud, Taher, 4,249,957, Cl. 136-258.000.

Davidson, J. E. Safety enclosure assembly for storage batteries. 4,250,232, Cl. 429-56.000.

Davidson, Philip J.: *See*—
Cooper, David; and Davidson, Philip J., 4,250,469, Cl. 332-1.000.

Davis, Bryce D., to Canada, Her Majesty the Queen in right of. Square wave/sine wave conversion. 4,250,455, Cl. 328-167.000.

Davis, Elgan A. Methods for reducing calcium deposits. 4,250,167, Cl. 424-94.000.

Davis, Eugene B., to A-Dec, Inc. Warm water dental syringe. 4,249,899, Cl. 433-32.000.

Davis, George B., Jr. Hand held electric caulking gun. 4,249,677, Cl. 222-326.000.

Davis, Howard F., Jr.; and Persson, John A., to Pennsylvania Engineering Corporation. Method for producing cement clinker from cement kiln waste dust. 4,249,952, Cl. 106-103.000.

Davis, James A.; MacPherson, William F.; and Shackle, Peter W., to Bell Telephone Laboratories, Incorporated. Control circuitry using a pull-down transistor for high voltage field terminated diode solid-state switches. 4,250,409, Cl. 307-252.00A.

Davis, James W. Process and apparatus for sealing gas lines. 4,249,577, Cl. 138-92.000.

Davis, Lee A., to Gould Inc. Electronic overcurrent detection and tripping circuit. 4,250,532, Cl. 361-96.000.

Davis, Roman: *See*—
Dawson, Daniel J.; Otteson, Kenneth M.; and Davis, Roman, 4,250,327, Cl. 560-169.000.

Davy International Aktiengesellschaft: *See*—
Lell, Rainer; and Lemberg, Werner, 4,249,921, Cl. 55-269.000.

Davy-Loewy Limited: *See*—
Causton, Robert J.; and Richardson, Joseph, 4,250,025, Cl. 209-38.000.

Dawson, Daniel J.; Otteson, Kenneth M.; and Davis, Roman, to Dynapol. Polymeric yellow colorant. 4,250,327, Cl. 560-169.000.

Day, Janet A.: *See*—
Searle, Robert J. G.; and Day, Janet A., 4,249,936, Cl. 71-95.000.

Day, Robert L. Concealed releasable frame structure. 4,249,830, Cl. 403-7.000.

Dayco Corporation: *See*—
Kleykamp, Donald L., 4,249,665, Cl. 213-61.000.

De Lorean Manufacturing Company: *See*—
Mathis, Robert D.; and Hine, Gordon, 4,249,323, Cl. 37-42.00R.

Dean, Desmond A.; and Young, David M., to Fisons Limited. Inhalation device. 4,249,526, Cl. 128-203.150.

Deane, Moray P., to D S B Valves Limited. Fluid pressure-operated valves. 4,249,566, Cl. 137-498.000.

Dearborn Rubber Company: *See*—
Cook, Francis E., 4,250,223, Cl. 428-285.000.

DeCaro, Aristide R.; and Strobel, Rudolf F., to Westinghouse Electric Corp. Photoflash lamp having gap-fire ignition mount, and method of making the mount. 4,249,887, Cl. 431-365.000.

Dechenne, Roger: *See*—
Hubert, Guy; and Dechenne, Roger, 4,249,666, Cl. 215-1.00C.

DeCristofaro, Nicholas J.; Freilich, Alfred; and Nathasingh, Davidson M., to Allied Chemical Corporation. Method of enhancing the magnetic properties of an $Fe_aB_bSi_cC_d$ amorphous alloy. 4,249,969, Cl. 148-108.000.

Deepsea Ventures, Inc.: *See*—
Latimer, John P., 4,249,324, Cl. 37-58.000.

Deere & Company: *See*—
Clifford, Jimmie D.; Girsch, David E.; and Magruder, Michael K., 4,249,558, Cl. 137-115.000.
Dolberg, Dale R.; and Guiter, Jack L., 4,249,366, Cl. 56-98.000.
Frank, William R., 4,249,782, Cl. 308-187.000.
Hubbard, Arthur L.; Copley, Russell D.; and Nieman, Merle D., 4,249,365, Cl. 56-13.200.
Huneke, Walter, 4,249,631, Cl. 180-255.000.
Kiefer, Edward H.; Lysenko, George P.; and Cade, Richard L., 4,250,486, Cl. 340-52.00R.
Saele, Arvid H., 4,249,922, Cl. 55-315.000.
Shindelar, Aloysius C.; and Deere & Company, 4,249,572, Cl. 137-614.040.

De Fonso, Alexander: *See*—
Ellis, Harold; De Fonso, Alexander; and Rosa, Stephen, 4,250,398, Cl. 219-345.000.

Dehan, Charles J. M., to Etablissement Ariabel, LIX. Friction type gymnastic apparatus. 4,249,727, Cl. 272-132.000.

Dehn, Dietmar: *See*—
Strausfeld, Hermann; Schloesser, Herbert; and Dehn, Dietmar, 4,249,876, Cl. 425-145.000.

Delahaye, Hubertus J. A.: *See*—
van de Mond, Theodorus J.; and Delahaye, Hubertus J. A., 4,250,118, Cl. 568-338.000.

Delalande S.A.: *See*—
Bucher, Bernard P.; Ancher, Jean-Francois R.; and Imbert, Thierry F., 4,250,178, Cl. 424-251.000.
Dostert, Philippe L.; Douzon, Colette A.; Bourgery, Guy R.; Gouret, Claude G.; Mocquet, Gisele C.; and Coston, Jean-Alain, 4,250,318, Cl. 548-229.000.

Delaune, Ralph H.: *See*—
Christenson, Christopher P.; McNamee, Gary M.; and Delaune, Ralph H., 4,249,939, Cl. 75-109.000.

Delbouille, Andre; and Derroitte, Jean L., to Solvay & Cie. Process and catalyst components for the polymerization and the copolymerization of olefins. 4,250,284, Cl. 526-124.000.

de Leeuw, Johannes A. N.; and Brugmans, Johannes T., to Lurex B.V. Transfer metallizing process and product produced thereby. 4,250,209, Cl. 427-250.000.

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Baes, Emile; Navez, Jean-Pierre; and Della Faille de Leverghem, Marc, 4,249,991, Cl. 162-152.000.

DeLong, Harold D. Adjustable headrest. 4,249,712, Cl. 248-118.000.

Delphic Research Laboratories, Inc.: *See*—
Ellis, Harold; De Fonso, Alexander; and Rosa, Stephen, 4,250,398, Cl. 219-345.000.

Demco, Inc.: *See*—
Burns, Daniel E., 4,249,388, Cl. 62-185.000.

Denis, Jean, to Electricite De France (Service National). Method and device for locating a defective tube in a steam generator tube bundle. 4,249,413, Cl. 73-49.100.

Denka Chemical Corporation: *See*—
Click, Gaylon T.; Turner, Nathan L.; and Hoff, Edwin F., Jr., 4,250,083, Cl. 260-45.9QB.

Denker, Bernard L.; and Hoffert, Franklin D., to Hydrocarbon Research, Inc. Combustible fuel composition. 4,249,911, Cl. 44-53.000.

Denlinger, Edgar J., to RCA Corporation. Flip chip mounted diode. 4,250,520, Cl. 357-68.000.

Denning, Ralph E., to Caterpillar Tractor Co. Unlocking differential. 4,249,429, Cl. 74-711.000.

de Nucheze, Louis; and Robin, Marcel, to Commissariat a l'Energie Atomique. Steam generator with an integrated reheater fed with a liquid metal. 4,249,484, Cl. 122-32.000.

Denzinger, Walter; and Cordes, Claus, to BASF Aktiengesellschaft. Preparation of copolymers from maleic anhydride and alkenes. 4,250,289, Cl. 526-201.000.

de Panafieu, Arnaud; Baylac, Christiane; Nemaud, Yves; Turpin, Marc; and Faure, Michel, to Thomson-CSF. Process for the production of graded index optical fibres. 4,249,924, Cl. 65-2.000.

Derda, Harry J.: *See*—
Ko, Wen H.; Fleming, David G.; Derda, Harry J.; and Martin, William O., 4,249,527, Cl. 128-204.180.

Derkach, Alexei S.: *See*—
Kaluzhsky, Nikolai A.; Gefter, Semen E.; Tsybukov, Igor K.; Evdokimov, Svetozar V.; Derkach, Alexei S.; Tsyplakov, Anatoly M.; Lankin, Valery P.; Velichko, Boris P.; Kostin, Albert A.; Volfson, Grigory E.; and Nikiforov, Vladimir P., 4,250,012, Cl. 204-243.00M.

Derroitte, Jean L.: *See*—
Delbouille, Andre; and Derroitte, Jean L., 4,250,284, Cl. 526-124.000.

Desbois-Chauvette, Colette: *See*—
Leclerc, Jean-Francois; and Desbois-Chauvette, Colette, 4,249,439, Cl. 83-71.000.

de Schrijver, Marc, to Solco Basel AG. Method and kit for the preparation of radiopharmaceuticals. 4,250,161, Cl. 424-1.000.

Design Programmes: *See*—
Tallon, Roger, 4,250,218, Cl. 428-166.000.

Des Jarlais, Gerald J.: *See*—
Griffin, Cecil A.; and Des Jarlais, Gerald J., 4,249,848, Cl. 414-332.000.

Desma-Werke GmbH: *See*—
Koch, Friedrich; and Thiele, Norbert, 4,249,882, Cl. 425-547.000.

Dethloff, Jurgen; and Heyden, Hans-Peter, to Dethloff, Jurgen. Text processing apparatus. 4,250,560, Cl. 364-900.000.

Deutsch, Leslie J.: *See*—
Deutsch, Ralph; and Deutsch, Leslie J., 4,249,448, Cl. 84-1.230.

Deutsch, Ralph; and Deutsch, Leslie J., to Kawai Musical Instrument Mfg. Co. Ltd. Even-odd symmetric computation in a polyphonic tone synthesizer. 4,249,448, Cl. 84-1.230.

Deutsche Automobilgesellschaft mbH, Firma: *See*—
Haschka, Friedrich; and Berger, Gerhard, 4,250,236, Cl. 429-221.000.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See*—
Bode, Rudolf; Reisert, Arthur; Turk, Gunter; and Strack, Hans, 4,250,081, Cl. 260-42.460.
Goedecke, Ralf; Liebert, Martin; Nischk, Wolfgang; Kurandt, Uwe; and Mewes, Dieter, 4,250,308, Cl. 544-190.000.

De Vries, Willem: *See*—
Haafkens, Rudolf; Luque, Rafael F.; and De Vries, Willem, 4,249,609, Cl. 166-280.000.

Dhondt, Roland O., to Union Oil Company of California. Method for introducing solids into a solids upflow vessel. 4,249,855, Cl. 414-786.000.

Diaz, Michael. Cardboard container cover. 4,249,693, Cl. 229-43.000.

Dick, David C.; and Hurt, James M., Jr., to Texas Utilities Services, Inc. Absorber tower isolation system. 4,249,916, Cl. 55-73.000.

Diermayer, Werner; Kutzner, Luitpold; and Postenreider, Erwin. Draft control arrangement. 4,249,694, Cl. 236-1.00G.

Diewald, Gunther: *See*—
Rossmann, Rudolf; Engel, Walter; and Diewald, Gunther, 4,249,466, Cl. 102-60.000.

Digital Communications Corporation: *See*—
Richmond, Robert L.; and Wyar, Paul F., 4,250,458, Cl. 329-112.000.

Diker, Charles M.: *See*—
Moe, Walter; Diker, Charles M.; and Bernstein, Lawrence A., 4,249,336, Cl. 46-17.000.

Dillman, Bruce A., to Bituma Stor, Inc. Sealing closure for asphalt mix storage bin outlet. 4,249,679, Cl. 222-542.000.

DiMatteo, Paul; and Stern, Howard K., to Solid Photography Inc. Arrangement for color coding of surfaces. 4,249,827, Cl. 356-402.000.

Dob, Allan M.: *See*—
Beckerman, Howard L.; and Dob, Allan M., 4,250,495, Cl. 340-365.00C.

Dobbs, Fred J.; Taylor, Marshall W.; and Gulley, Rinda S., to Dobbs-Stanford. Reloadable cassette. 4,249,710, Cl. 242-199.000.

Dobbs-Stanford: *See*—
Dobbs, Fred J.; Taylor, Marshall W.; and Gulley, Rinda S., 4,249,710, Cl. 242-199.000.

Dobrosielski, Stephen S.: *See*—
Johnston, Robert J.; Layciak, Stephen G.; and Dobrosielski, Stephen S., 4,250,368, Cl. 200-307.000.

Dobson Park Industries Limited: *See*—
Bell, Jack W., 4,249,768, Cl. 296-63.000.

Doering, August P., to American Hoechst Corporation. Uniform exposure of positive-acting diazo type materials through support. 4,250,242, Cl. 430-141.000.

Doiron, Joseph. Hackle clamp. 4,249,434, Cl. 81-43.000.

Dolberg, Dale R.; and Guiter, Jack L., to Deere & Company. Forage harvester header with upper stalk control. 4,249,366, Cl. 56-98.000.

Dold, Berthold, to Kienzle Apparate GmbH. Recording apparatus. 4,249,745, Cl. 369-219.000.

Dolhyj, Serge R.: *See*—
Shaw, Wilfrid G.; Milberger, Ernest C.; and Dolhyj, Serge R., 4,250,054, Cl. 252-437.000.

Dolle, Lucien, to Commissariat a l'Energie Atomique. Method for unclogging an electromagnetic filter and an installation for carrying out said method. 4,249,994, Cl. 176-37.000.

Dombeck, Le Roy: *See*—
Miller, Kenneth; and Dombeck, Le Roy, 4,249,684, Cl. 224-42.400.

Domenico, Frigo, to F.I.A.M.M. S.p.A. Fabbrica Italiana Accumulatori Motocarri Montecchio. Vibration-resistant coupling for insulated electrical conductor. 4,250,497, Cl. 340-404.000.

Dominion Engineering Works Limited: *See*—
Stegelitz, Wilhelmus J.; and Bernreiter, George P., 4,249,993, Cl. 162-381.000.

Donnelly, Donald E.; and Krump, Robert C., to Emerson Electric Co. Charging circuit for battery in thermostat with battery operated timer. 4,249,696, Cl. 236-46.00R.

Donovan, Daniel L., to Borg-Warner Corporation. Slide valve carburetor idle fuel delivery system. 4,250,125, Cl. 261-41.00B.

Doremus, John F., to Avon Products, Inc. Method for forming and polishing soap billets. 4,250,133, Cl. 264-130.000.

Dorey, Howard A.; Martin, Edward A.; and Spooner, Michael I., to Solartron Electronic Group Limited, The. Multi function patch pin circuit. 4,250,407, Cl. 307-209.000.

Dorries, Peter; Piesch, Steffen; and Wolf, Alfons, to Cassella Aktiengesellschaft. Melamine resin, process for its manufacture and its use for the manufacture of coated wood-based materials and laminates. 4,250,282, Cl. 525-509.000.

Dostert, Philippe L.; Douzon, Colette A.; Bourgery, Guy R.; Gouret, Claude G.; Mocquet, Gisele C.; and Coston, Jean-Alain, to Delalande S.A. Novel 5-hydroxymethyl oxazolidinones, the method of preparing them and their application in therapeutics. 4,250,318, Cl. 548-229.000.

Dostrovsky, Israel, to Yeda Research and Development Co. Ltd. Solar collector. 4,249,513, Cl. 126-438.000.

Dotson, Andy S. Waiter signal device. 4,250,491, Cl. 340-321.000.

Douglas, Lawrence M., to Polaroid Corporation. Film advancing apparatus. 4,249,811, Cl. 354-86.000.

Douzon, Colette A.: *See—*
Dostert, Philippe L.; Douzon, Colette A.; Bourgery, Guy R.; Gouret, Claude G.; Mocquet, Gisele C.; and Coston, Jean-Alain, 4,250,318, Cl. 548-229.000.

Dover Corporation: *See—*
Erickson, Milton W.; and White, Donald M., III, 4,250,366, Cl. 200-157.000.

Dow Chemical Company, The: *See—*
Bertram, James L.; and Su Sheih, Pong, 4,250,100, Cl. 260-348.140.
Broxterman, William E.; and Brown, Frederick L., 4,250,214, Cl. 428-514.000.
Christenson, Christopher P.; McNamee, Gary M.; and Delaune, Ralph H., 4,249,939, Cl. 75-109.000.
Flagg, Edward E., 4,250,105, Cl. 260-453.00P.
Flagg, Edward E., 4,250,309, Cl. 544-221.000.
French, Floyd R., 4,249,681, Cl. 222-380.000.
Hinkel, Jerald J., 4,250,044, Cl. 252-8.55R.
Lowery, Kirby, Jr.; Knight, George W.; and May, James A., Jr., 4,250,288, Cl. 526-137.000.
Shipley, Randall S., 4,250,286, Cl. 526-125.000.

Dow Corning Corporation: *See—*
Monroe, Carl M.; and Sweet, Randall P., 4,250,075, Cl. 260-33.6SB.

Drabek, Jozef; and Boger, Manfred, to Ciba-Geigy Corporation. (O-(N-Methylcarbamoyl)-oxime)-(N,N,N-trialkylurea)-N,N-sulfide derivatives, processes for producing them, compositions containing these derivatives as active ingredients, and the use thereof for controlling insect pests. 4,250,190, Cl. 424-298.000.

Dragerwerk Aktiengesellschaft: *See—*
Mathes, Heinz, 4,249,528, Cl. 128-205.130.
Pasternack, Adalbert; and Warncke, Ernst, 4,249,473, Cl. 116-70.000.

Dragone, Corrado, to Bell Telephone Laboratories, Incorporated. Scanning beam antenna arrangement. 4,250,508, Cl. 343-779.000.

Drake, James F.: *See—*
Nelson, Robert L.; and Drake, James F., 4,250,264, Cl. 435-253.000.

Dravo Corporation: *See—*
Jaquay, Louis H., 4,249,722, Cl. 266-172.000.

Dreibelbis, Richard C., to Emerson Electric Co. (H & H Prod. Div). Thermally actuated modulating valve, and assemblies and systems utilizing the same for providing temperature controlled heated water. 4,249,695, Cl. 236-12.00L.

Dresser Industries, Inc.: *See—*
Dysart, Theodore R., 4,249,622, Cl. 175-227.000.
McGuire, Robert C., 4,249,778, Cl. 299-64.000.
Palm, Michael M., 4,249,625, Cl. 180-6.700.

Dressler, John L., to Mead Corporation, The. Fluid jet device. 4,250,510, Cl. 346-75.000.

Drews, Ulrich; Schnurle, Hans; and Horbelt, Michael, to Robert Bosch GmbH. Apparatus for correcting a fuel apportionment signal in an internal combustion engine. 4,249,498, Cl. 123-478.000.

Dripps, Rick W.: *See—*
Christenson, Larry E.; Dripps, Rick W.; Gillette, John E.; and Mittleberg, Mark S., 4,249,461, Cl. 98-38.00R.

Dryden, Joseph L., to Bixby-Zimmer Engineering Co. Screen device and method. 4,250,038, Cl. 210-409.000.

Dual Gebruder Steidinger: *See—*
Broghammer, Werner, 4,250,527, Cl. 360-75.000.

Dudash, Allan A.; Melvin, Waymon A., Jr.; and Vercellotti, Leonard C., to Westinghouse Electric Corp. Distribution network communication system having branch connected repeaters. 4,250,489, Cl. 340-147.00T.

Dugan, Charles; and Dugan, Timothy, to Farm Fresh Shrimp Corporation. Apparatus and method for rearing shrimp. 4,249,480, Cl. 119-2.000.

Dugan, Timothy: *See—*
Dugan, Charles; and Dugan, Timothy, 4,249,480, Cl. 119-2.000.

Duggan, Daniel C. Backflow preventer valve. 4,249,568, Cl. 137-513.000.

Duke, James M.: *See—*
Bieberbach, George; Bongaards, Donald J.; Lohmeier, Alfred; and Duke, James M., 4,249,593, Cl. 165-70.000.

Dunbar, Glenn G. Scale testing cart. 4,249,633, Cl. 180-306.000.

Duncan, Michael G. Circuit detector and compression-expansion networks utilizing same. 4,250,471, Cl. 333-14.000.

Dunham-Bush, Inc.: *See—*
Shaw, David N.; and First, David J., 4,249,866, Cl. 417-280.000.

Du Pont de Nemours, E. I., and Company: *See—*
Shimshick, Edward J., 4,250,331, Cl. 562-485.000.

DuPont, Preston S.; and Rogers, Howard H., to Hughes Aircraft Company. Battery electrode structure. 4,250,235, Cl. 429-211.000.

Durbin, John A.; and Rees, James D., to Xerox Corporation. Full frame flash illumination system utilizing a diffuse integrating optical cavity. 4,250,538, Cl. 362-97.000.

Durkin, Gary M.: *See—*
Elkins, Robert H.; Durkin, Gary M.; and Macriss, Robert A., 4,249,594, Cl. 165-104.00F.

Dursch, Walter; Linke, Fritz; and Kleiner, Hans-Jerg, to Hoechst Aktiengesellschaft. Organic phosphorus compounds possessing 3-hydroxyalkylphosphinic acid ester groups. 4,250,124, Cl. 260-928.000.

Duttlinger, Jean C., to Wolber. Bicycle tire with improved reinforcing strip. 4,249,587, Cl. 152-354.00R.

Dvorachek, Harold A., to Echlin Manufacturing Company, The. Pressure actuated switch with actuator having contact-actuating rib between piston and spring-guide portions. 4,250,361, Cl. 200-82.00R.

Dyachenko, Petr Y.: *See—*
Mikhailov, Viktor V.; Karakovsky, Alexandr K.; Dyachenko, Petr Y.; Ivanov, Jury S.; Mikhailov, Igor V.; Lunin, Mikhail G.; Buyanov, Alexei V.; Konstantinov, Alexei A.; Shagurin, Anatoly S.; Kirillov, Alexandr P.; Mikhailov, Oleg V.; and Khaimov, Arkady S., 4,249,871, Cl. 425-111.000.

Dybas, Richard A.: *See—*
Grier, Nathaniel; Dybas, Richard A.; and Witzel, Bruce E., 4,250,184, Cl. 424-267.000.

Dynamit Nobel Aktiengesellschaft: *See—*
Hagel, Rainer; and Redecker, Klaus, 4,250,294, Cl. 528-210.000.

Dynapol: *See—*
Dawson, Daniel J.; Otteson, Kenneth M.; and Davis, Roman, 4,250,327, Cl. 560-169.000.

Dysart, Theodore R., to Dresser Industries, Inc. Floating seal for drill bits. 4,249,622, Cl. 175-227.000.

E. C. H. Will (GmbH & Co.): *See—*
Lampe, Siegfried; and Neubuser, Siegmar, 4,249,844, Cl. 414-45.000.

E. R. Squibb & Sons, Inc.: *See—*
Szarka, Laszlo J.; and Eltz, Robert W., 4,250,258, Cl. 435-45.000.

Eagle-Picher Industries, Inc.: *See—*
Atkisson, A. David, 4,249,930, Cl. 71-28.000.

Eakman, James M., to Exxon Research & Engineering Co. Production of ammonium sulfate. 4,250,160, Cl. 423-547.000.

Eastman Kodak Company: *See—*
Baigrie, Brian D.; Bailey, Joseph; Johnston, Linda G.; and Mijovic, Miroslav V., 4,250,238, Cl. 430-17.000.
Dannelly, Clarence C., 4,249,343, Cl. 47-57.600.
Gehin, Guy; and Fage, Eva, 4,250,245, Cl. 430-218.000.
McFarlane, Finley E.; and Taylor, Robert B., 4,250,078, Cl. 260-40.00R.
Osborn, Harland J.; Cameron, Robert G.; and Walsh, Edward J., 4,250,251, Cl. 430-449.000.
Potts, P. Keith, 4,249,634, Cl. 182-1.000.
Riecke, Edgar E., 4,250,281, Cl. 525-444.000.
Sanford, Karl J., 4,250,255, Cl. 435-15.000.
Vickers, Richard S., 4,250,237, Cl. 430-17.000.

Eaton Corporation: *See—*
Larkin, Robert E.; and Piber, Earl T., 4,250,369, Cl. 200-339.000.
Urban, John A., 4,249,644, Cl. 188-196.00D.

Ebata, Yasuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Temperature detector using a surface acoustic wave device. 4,249,418, Cl. 73-339.00A.

Ebauches Electroniques SA: *See—*
Mutrux, Claude, 4,250,574, Cl. 368-184.000.

Ebihara, Heihachiro; Sekiya, Fukuo; and Yamada, Takashi, to Citizen Watch Company Limited. Portable electronic device. 4,250,571, Cl. 368-10.000.

Echlin Manufacturing Company, The: *See—*
Dvorachek, Harold A., 4,250,361, Cl. 200-82.00R.

Eckels, Phillip W., to Electric Power Research Institute, Inc. Superconducting generator and method. 4,250,418, Cl. 310-64.000.

Eckelt, Michael: *See—*
Asbeck, Adolf; Eckelt, Michael; Erwied, Werner; Heyden, Rudi; and Petzold, Manfred, 4,250,050, Cl. 252-354.000.

Ecklund, Ray A.: *See—*
Jackson, Charles A.; and Ecklund, Ray A., 4,249,636, Cl. 182-152.000.

Ecolotrol, Inc.: *See—*
Hickey, Robert F.; and Owens, Roger W., 4,250,033, Cl. 210-106.000.

Eddins, Fred D.; and Tepper, Sidney, to Hasbro Industries, Inc. Toy Raceway. 4,249,733, Cl. 273-86.00C.

Eddy, William R.; and Richards, Frank P., to Phillips Petroleum Company. Fluid dispensing apparatus for use with a container assembling machine or the like. 4,249,479, Cl. 118-708.000.

Edson, Theresa M. Breast feeding doll set. 4,249,337, Cl. 46-153.000.

Edwards, K. David G. Preventing renal failure. 4,250,191, Cl. 424-308.000.

Efimov, Alexei V.; Berlin, Alfred A.; Kefeli, Tamara Y.; Varlamova, Nina V.; Strongin, Grigory M.; Altshuler, Judif M.; and Kolomazov, Boris I. Oligourethanacrylates and methods for their manufacture. 4,250,322, Cl. 560-26.000.

Efka-Werke Fritz Kiehn GmbH: *See—*
Heil, Richard; Gatschmann, Klaus; and Wieshofer, Anton, 4,249,546, Cl. 131-70.000.

Egan, William E., to Goodyear Tire & Rubber Company, The. Pneumatic tire. 4,249,588, Cl. 152-357.00R.

Eggeling, Lothar; Paschke, Manfred; and Sahm, Hermann, to Kernforschungsanlage Julich Gesellschaft m.b.H. Process for the microbial production of alcoholoxidase. 4,250,261, Cl. 435-190.000.

Eheim, Franz; and Straubel, Max, to Robert Bosch GmbH. Fuel injection apparatus having at least one fuel injection valve for high-powered engines. 4,249,497, Cl. 123-446.000.

Ehresmann, Ewald. Fuel system for internal combustion engines. 4,249,501, Cl. 123-552.000.

Ehrlich, Jurgen: *See—*
Sommer, Neithart; Nordsiek, Karl-Heinz; and Ehrlich, Jurgen, 4,250,082, Cl. 260-42.550.

Eichelberger, Charles W., to General Electric Company. Gas discharge display circuit. 4,250,504, Cl. 340-758.000.

Eichelberger, Charles W.: *See—*
Butler, Walter J.; and Eichelberger, Charles W., 4,250,494, Cl. 340-347.0CC.

Eicken, Karl: *See—*
Hansen, Hanspeter; Eicken, Karl; and Wuerzer, Bruno, 4,249,933, Cl. 71-88.000.

Hansen, Hanspeter; Eicken, Karl; and Wuerzer, Bruno, 4,249,935, Cl. 71-92.000.
Eilingsfeld, Heinz; Hansen, Guenter; Seybold, Guenther; and Zeidler, Georg, to BASF Aktiengesellschaft. 2-Amino-5-arylazoarylazothiazole compounds. 4,250,090, Cl. 260-158.000.
Eisenwerk-Gesellschaft Maximilianshutte mbH: *See*—
Knuppel, Helmut; Brotzmann, Karl; Fassbinder, Hans-Georg; and Fritz, Ernst, 4,249,719, Cl. 266-47.000.
Eitel, Alfred: *See*—
Niederdellmann, Georg; Goyert, Wilhelm; Meisert, Ernst; Eitel, Alfred; Wagner, Hans; and Hespe, Hans, 4,250,292, Cl. 528-44.000.
Ekis, Felix A.: *See*—
Korenev, Vladimir P.; Ippolitov, Jury S.; Belyaev, Boris P.; Kalninsh, Arvid Y.; Vedernikov, Nikolai A.; Krastinsh, Valter P.; Abolinsh, Guntis K.; Abele, Karl M.; and Ekis, Felix A., 4,249,703, Cl. 241-247.000.
Electric Power Research Institute, Inc.: *See*—
Eckels, Phillip W., 4,250,418, Cl. 310-64.000.
Heberlein, Joachim V. R.; and Holmes, Francis A., 4,250,363, Cl. 200-144.00B.
Kimblin, Clive W.; Holmes, Francis A.; Heberlein, Joachim V. R.; Gorman, Joseph G.; and Slade, Paul G., 4,250,364, Cl. 200-144.00B.
McConnell, Lorne D., 4,250,365, Cl. 200-150.00R.
Electricite De France (Service National): *See*—
Denis, Jean, 4,249,413, Cl. 73-49.100.
Electronics Corporation of America: *See*—
Cade, Phillip J., 4,249,884, Cl. 431-31.000.
Elkhart Brass Manufacturing Co., Inc.: *See*—
Thompson, William S., 4,249,717, Cl. 251-210.000.
Elkins, Robert H.; Durkin, Gary M.; and Macriss, Robert A., to Southern California Gas Company. High efficiency furnace. 4,249,594, Cl. 165-104.00F.
Ellis, Harold; De Fonso, Alexander; and Rosa, Stephen, to Delphic Research Laboratories, Inc. Solid state electrically conductive laminate. 4,250,398, Cl. 219-345.000.
Elms, Robert T., to Westinghouse Electric Corp. AC Electric energy meter utilizing a counter as an integrator. 4,250,552, Cl. 364-483.000.
Eltz, Robert W.: *See*—
Szarka, Laszlo J.; and Eltz, Robert W., 4,250,258, Cl. 435-45.000.
Emerson Electric Co.: *See*—
Arnold, Harold D., 4,250,417, Cl. 310-62.000.
Donnelly, Donald E.; and Krump, Robert C., 4,249,696, Cl. 236-46.00R.
King, Reynold C., 4,250,399, Cl. 219-532.000.
Little, Carl H., 4,249,282, Cl. 16-32.000.
Emerson Electric Co. (H & H Prod. Div): *See*—
Dreibelbis, Richard C., 4,249,695, Cl. 236-12.00L.
Emhart Industries, Inc.: *See*—
Grah, Neil E.; and Weaver, Robert F., 4,250,420, Cl. 310-83.000.
EMI Electrola Gesellschaft mit beschrankter Haftung: *See*—
Strausfeld, Hermann; Schloesser, Herbert; and Dehn, Dietmar, 4,249,876, Cl. 425-145.000.
EMI Limited: *See*—
Hounsfield, Godfrey N.; Waltham, Richard M.; Pisano, Daniel J., Jr.; and Olson, Erlvada A., 4,250,387, Cl. 250-445.00T.
Energy Research Corporation: *See*—
Maru, Hansraj C., 4,250,231, Cl. 429-13.000.
Engel, Walter: *See*—
Rossmann, Rudolf; Engel, Walter; and Diewald, Gunther, 4,249,466, Cl. 102-60.000.
Engelhardt, Friedrich: *See*—
Weckler, Gerhard; Hauss, Hans J.; Hintermeier, Karl; and Engelhardt, Friedrich, 4,250,296, Cl. 528-295.000.
Engineering Dynamics Corporation: *See*—
Leask, John W.; Leask, John C.; and Straus, Harry W., 4,250,392, Cl. 250-505.000.
Englert, Wieslaw: *See*—
Bambuch, Tadeusz; Wilusz, Henryk; Englert, Wieslaw; Czank, Stanislaw; and Surmiak, Stanislaw, 4,249,964, Cl. 148-16.500.
Environmental Research Institute of Michigan: *See*—
Maes, Reed A., Jr., 4,249,340, Cl. 47-17.000.
ERCO Envirotech Ltd.: *See*—
Gilbert, Allan F.; and Rapson, W. Howard, 4,249,990, Cl. 162-17.000.
ERCO Industries Limited: *See*—
Cowley, Gerald, 4,250,159, Cl. 423-480.000.
Erich Ruhl Chemische Fabrik und Chemikalien-Grosshandel, Firma: *See*—
Newitzki, Berthold, 4,250,224, Cl. 428-310.000.
Erickson, Gerald. Bottle separating and connecting band. 4,249,766, Cl. 294-87.200.
Erickson, John W., to Kobe, Inc. Pumping apparatus for fluids containing abrasive particulates. 4,249,860, Cl. 415-111.000.
Erickson, Milton W.; and White, Donald M., III, to Dover Corporation. Trigger assembly for arc welding gun. 4,250,366, Cl. 200-157.000.
Erikson, Keith W.: *See*—
Erikson, Kenneth W.; and Erikson, Keith W., 4,249,426, Cl. 74-441.000.
Erikson, Kenneth W.; and Erikson, Keith W., to Kerk Motion Products, Inc. Anti-backlash nut having longitudinal flexural members with ramps thereon and means to apply an axial pre-load force to said ramps. 4,249,426, Cl. 74-441.000.
Erway, Duane D.: *See*—
Rowlette, John J., 4,250,140, Cl. 422-43.000.
Erwied, Werner: *See*—
Asbeck, Adolf; Eckelt, Michael; Erwied, Werner; Heyden, Rudi; and Petzold, Manfred, 4,250,050, Cl. 252-354.000.
Erwin Sick GmbH, Optik-Elektronik: *See*—
Walter, Arthur, 4,250,498, Cl. 340-556.000.
Esaki, Leo; Tsu, Raphael; Sai-Halasz, George A.; and Chang, Leroy L., to United States of America, Army. Heterojunction superlattice with potential well depth greater than half the bandgap. 4,250,515, Cl. 357-16.000.
Escher Wyss Ltd.: *See*—
Lehmann, Rolf, 4,249,290, Cl. 29-116.0AD.
Espana, Salvador, to Smith International, Inc. Friction bearing rock bit and segment. 4,249,621, Cl. 175-227.000.
Estes, John H.; and Buinicky, Ernest P., to Texaco Inc. Recovery of bitumen from tar sand. 4,250,016, Cl. 208-11.0LE.
Etablissement Ariabel: *See*—
Dehan, Charles J. M., 4,249,727, Cl. 272-132.000.
Ethicon, Inc.: *See*—
Cerwin, Robert J.; and Yolinsky, Robert H., 4,249,656, Cl. 206-63.300.
Etoh, Yukihiro: *See*—
Sugasawa, Fukashi; Iizuka, Haruhiko; Matsumoto, Junichiro; and Etoh, Yukihiro, 4,249,374, Cl. 60-276.000.
Eurallumina S.p.A.: *See*—
Costa, Giuseppe, 4,250,032, Cl. 423-121.000.
Evans, David M.; and Sabis, Richard J., to S & C Electric Company. Auxiliary switch for indicating the condition of a circuit-interrupting device. 4,250,476, Cl. 335-17.000.
Evans, Duane E.; Brown, William L., Jr.; and Johnson, Roger W., to Caterpillar Tractor Co. Exhaust gas recirculation system for turbo charged engines. 4,249,382, Cl. 60-605.000.
Evdokimov, Svetozar V.: *See*—
Kaluzhsky, Nikolai A.; Gefter, Semen E.; Tsybukov, Igor K.; Evdokimov, Svetozar V.; Derkach, Alexei S.; Tsyplakov, Anatoly M.; Lankin, Valery P.; Velichko, Boris P.; Kostin, Albert A.; Volfson, Grigory E.; and Nikiforov, Vladimir P., 4,250,012, Cl. 204-243.00M.
Everitt, Delmar K.: *See*—
Goldfarb, Adolph E.; and Everitt, Delmar K., 4,249,334, Cl. 46-1.00J.
EvG Entwicklungs-u. verwertungs-GmbH: *See*—
Gott, Hans; Ritter, Josef; Ritter, Klaus; Ritter, Gerhard; and Schmidt, Gerhard, 4,249,841, Cl. 414-14.000.
Ewins, Earle E., Jr.; and Cocker, Jr., deceased; Geroge T., to Shell Oil Company. Adhesive compositions. 4,250,272, Cl. 525-89.000.
Explosafe America Inc.: *See*—
Szego, Andrew, 4,249,669, Cl. 220-216.000.
Exxon Research & Engineering Co.: *See*—
Coupland, Keith; and Smith, Clinton R., 4,250,045, Cl. 252-32.70E.
Eakman, James M., 4,250,160, Cl. 423-547.000.
Hou, Ching-Tsang; Patel, Ramesh N.; and Laskin, Allen I., 4,250,259, Cl. 435-148.000.
Long, Robert B.; Gorbaty, Martin L.; and Vernon, Lonnie W., 4,250,014, Cl. 208-8.0LE.
McVicker, Gary B., 4,250,329, Cl. 560-232.000.
Parekh, Bhupendra K.; and Goldberger, William M., 4,249,700, Cl. 241-24.000.
F.I.A.M.M. S.p.A. Fabbrica Italiana Accumulatori Motocarri Montecchio: *See*—
Domenico, Frigo, 4,250,497, Cl. 340-404.000.
Fage, Eva: *See*—
Gehin, Guy; and Fage, Eva, 4,250,245, Cl. 430-218.000.
Fansteel Inc.: *See*—
Witter, Gerald J., 4,249,944, Cl. 75-211.000.
Farber, Gerald: *See*—
Yang, Ralph T.; Smol, Robert; Farber, Gerald; and Naphtali, Leonard M., 4,250,015, Cl. 208-10.000.
Farish, Owen: *See*—
Hundstad, Richard L.; and Farish, Owen, 4,250,468, Cl. 331-94.5PE.
Farm Fresh Shrimp Corporation: *See*—
Dugan, Charles; and Dugan, Timothy, 4,249,480, Cl. 119-2.000.
Farmitalia Carlo Erba S.p.A.: *See*—
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Alessandro; Fumagalli, Angelo; Faustini, Franco; Ceserani, Roberto; and Usardi, Maria M., 4,250,188, Cl. 424-285.000.
Farrar, Ralph C., to Phillips Petroleum Company. Solution polymerization with molecular sieve purification of recycled solvent. 4,250,270, Cl. 525-54.000.
Fassbinder, Hans-Georg: *See*—
Knuppel, Helmut; Brotzmann, Karl; Fassbinder, Hans-Georg; and Fritz, Ernst, 4,249,719, Cl. 266-47.000.
Faure, Michel: *See*—
de Panafieu, Arnaud; Baylac, Christiane; Nemaud, Yves; Turpin, Marc; and Faure, Michel, 4,249,924, Cl. 65-2.000.
Faust, Raimund J., to Hoechst Aktiengesellschaft. Photopolymerizable mixture containing unsaturated polyurethane. 4,250,248, Cl. 430-284.000.
Faust, Reginald O. Exercise bench safety device. 4,249,726, Cl. 272-123.000.
Faustini, Franco: *See*—
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Alessandro; Fumagalli, Angelo; Faustini, Franco; Ceserani, Roberto; and Usardi, Maria M., 4,250,188, Cl. 424-285.000.

Fedyaev, Igor B.: *See—*
Bulakhov, Evgeny K.; and Fedyaev, Igor B., 4,250,542, Cl. 363-35.000.

Fehrer, Ernst. Apparatus for manufacturing a yarn. 4,249,368, Cl. 57-5.000.

Feldstein, Cyril: *See—*
United States of America, National Aeronautics and Space Administration; Feldstein, Cyril; Lewis, Gilbert W.; Culler, Virgil H.; and Merrbaum, Samuel, 4,249,417, Cl. 73-141.00A.

Felfoldi, Karoly; Apjok, Jozsef; Bartok, Mihaly; Czombos, Jozsef; Molnar, Arpad; Noteisz, Ferenc; Karpati, Egon; and Szporny, Laszlo, to Richter Gedeon Vegyeszeti Gyar R.T. 3-[4-(3-Methoxyphenyl)-piperazin-1-yl]-1-(furan-2-carbonyloxy)-propane. 4,250,310, Cl. 544-379.000.

Ferb, Robert J.: *See—*
Biedell, Edward L.; and Ferb, Robert J., 4,250,152, Cl. 423-242.000.

Fernandez, Albert. Ladder extension apparatus. 4,249,638, Cl. 182-201.000.

Feuillade, Jean L. J., to B. M. Costamagna et Cie. Device for handling cross ties of prestressed concrete or analogous products. 4,249,440, Cl. 83-155.000.

Feuillade, Jean Louis J., to B. M. Costamagna et Cie. Manufacture of prestressed products. 4,249,873, Cl. 425-111.000.

Fields, Ronald S.: *See—*
Brooks, Dannie L.; and Fields, Ronald S., 4,249,705, Cl. 242-78.600.

Fields, Samuel; and Anderson, Wesley J., to Kawasaki Motors Corp. U.S.A. Liquid cooling system. 4,249,626, Cl. 180-54.00A.

Fieldtech Limited: *See—*
Southgate, Roger E., 4,250,496, Cl. 340-384.00E.

Fierkens, Richardus H. J. Method of encapsulating microelectronic elements. 4,250,347, Cl. 174-52.0PE.

Filterwerk Mann & Hummel GmbH: *See—*
Behrendt, Bernhard; Brenner, Gerhard; Fischer, Heinz; and Leipelt, Rudolf, 4,249,500, Cl. 123-556.000.

Finkenzeller, Johann: *See—*
Brendl, Rudolf; Finkenzeller, Johann; and Weiss, Karl, 4,250,389, Cl. 250-476.000.

Firestone Tire & Rubber Company, The: *See—*
Bohm, Georg G. A.; Hamed, Gary R.; and Vescelius, Lee E., 4,250,273, Cl. 525-99.000.
Burley, George J., 4,249,979, Cl. 156-412.000.

First, David J.: *See—*
Shaw, David N.; and First, David J., 4,249,866, Cl. 417-280.000.

Fischer, Heinz: *See—*
Behrendt, Bernhard; Brenner, Gerhard; Fischer, Heinz; and Leipelt, Rudolf, 4,249,500, Cl. 123-556.000.

Fischer & Porter Company: *See—*
Gaertner, Max, 4,250,557, Cl. 364-605.000.
Ratigan, Brian J., 4,250,144, Cl. 422-112.000.

Fish, Elson B.: *See—*
Shobert, Samuel M.; and Fish, Elson B., 4,249,980, Cl. 156-441.000.

Fisher, Chester G.: *See—*
Sebens, Carl R.; and Fisher, Chester G., 4,250,553, Cl. 364-510.000.

Fishman, Morris L., to FMC Corporation. Method of reducing the contents of haloethynyl-containing impurities in synthetic dihaloethenyl pyrethroid insecticides or intermediates by reaction with phosphites. 4,250,326, Cl. 560-124.000.

Fisons Limited: *See—*
Dean, Desmond A.; and Young, David M., 4,249,526, Cl. 128-203.150.
Needham, Brian J.; and Miller, John, 4,250,341, Cl. 568-361.000.

Fittery, Larry R., to Black & Decker Inc. Elevation setting mechanism for a table saw and the like. 4,249,442, Cl. 83-473.000.

Flagg, Edward E., to Dow Chemical Company, The. Production of aliphatic compounds containing isocyanato and hydroxyl functionality. 4,250,105, Cl. 260-453.00P.

Flagg, Edward E., to Dow Chemical Company, The. Halogenated alkenyl isocyanurate compounds. 4,250,309, Cl. 544-221.000.

Flagg, John F.; and Antos, George J., to UOP Inc. Acidic multimetallic catalytic composite. 4,250,055, Cl. 252-441.000.

Flaherty, John J.: *See—*
O'Connor, Donald T.; Lorenzi, Donald E.; Flaherty, John J.; and Schaefer, Edward, 4,249,810, Cl. 354-63.000.

Fleischer, Donald W., to Veeder Industries Inc. Fuel delivery control system. 4,250,550, Cl. 364-465.000.

Fleming, David G.: *See—*
Ko, Wen H.; Fleming, David G.; Derda, Harry J.; and Martin, William O., 4,249,527, Cl. 128-204.180.

Flogaus, William S.: *See—*
Helm, David P.; and Flogaus, William S., 4,249,791, Cl. 350-16.000.

Floyd, Middleton B., Jr., to American Cyanamid Company. 1-Descarboxy-1-ketoester(ketoacid)-protaglandins. 4,250,321, Cl. 560-53.000.

Floyd, Middleton B., Jr., to American Cyanamid Company. 1-Descarboxy-1-ketoester(ketoacid)-prostaglandins. 4,250,323, Cl. 560-53.000.

Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-Mei L., to American Cyanamid Company. Novel 15-deoxy-16-ethynyl and -16-(1-propynyl)-1-carboxy and 1-carbinol prostaglandins of the A, D, E and F series. 4,250,325, Cl. 560-121.000.

Flumm, Paul, to Timex Corporation. Illuminator for analog timepiece dial. 4,250,575, Cl. 368-227.000.

Flynn, Vincent J. Radiopaque polyurethane resin compositions. 4,250,072, Cl. 260-31.20N.

FMC Corporation: *See—*
Fishman, Morris L., 4,250,326, Cl. 560-124.000.
Haley, Frank P., 4,249,794, Cl. 350-96.200.
Wiederrich, James L.; Chang, Andrew K.; and Muray, Julius J., 4,249,824, Cl. 356-155.000.

Fogg, Douglas: *See*
Haag, George A.; Fogg, Douglas; Greenley, Gordon A.; Shepard, Steve A.; and Terry, F. Duncan, 4,250,562, Cl. 364-900.000.

Fogleman, Boyd C. Apparatus for bending steel tubes. 4,249,407, Cl. 72-217.000.

Foley, Lary L., to Clorox Company, The. Method of stabilizing fragrance oils. 4,250,165, Cl. 424-76.000.

Foley, Norman L., to Auscoteng Pty. Ltd. Centrifugal pump system for water desalinization. 4,249,864, Cl. 417-77.000.

Ford Motor Company: *See—*
Voll, Walter; and Matheis, Anton, 4,249,627, Cl. 180-73.00D.

Forsyth Dental Infirmary for Children: *See—*
Taubman, Martin A.; and Smith, Daniel J., 4,250,262, Cl. 435-193.000.

Foscante, Raymond E.; Gysegem, Albert P.; Martinich, Pamela J.; and Law, Gabriel H., to Ameron, Inc. Interpenetrating polymer network comprising epoxy polymer and polysiloxane. 4,250,074, Cl. 260-32.8EP.

Foster, Alan I.; James, Peter G.; McCarroll, John J.; and Tennison, Stephen R., to British Petroleum Company Limited, The. Process for producing a catalyst comprising a graphite containing carbon, a transitional metal and a modifying metal ion. 4,250,057, Cl. 252-447.000.

Foster-Miller Associates, Inc.: *See—*
Harvey, Andrew C.; and Burnett, Mackenzie, 4,249,838, Cl. 406-51.000.

Foster, Raymond F., to Telex Computer Products, Inc. Overload protection to prevent saturation of video amplifiers. 4,250,463, Cl. 330-298.000.

Foster Wheeler Energy Corporation: *See—*
Vatsky, Joel, 4,249,470, Cl. 110-232.000.

Frame, Robert R., to UOP Inc. Catalytic oxidation of mercaptan in petroleum distillate. 4,250,022, Cl. 208-206.000.

Francois, Jean-Pierre: *See—*
Colinet, Andre; Schwartz, Christian; and Francois, Jean-Pierre, 4,249,427, Cl. 74-471.00R.

Frank, William R., to Deere & Company. Self-aligning bearing and seal. 4,249,782, Cl. 308-187.000.

Franz, Gerhard: *See—*
Scharf, Helmut; Franz, Gerhard; and Hokele, Gunther, 4,250,119, Cl. 568-389.000.

Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See—*
Klaar, Richard, 4,249,468, Cl. 104-12.000.
Theurer, Josef, 4,249,325, Cl. 37-104.000.
Theurer, Josef; and Riessberger, Klaus, 4,249,346, Cl. 51-178.000.
Theurer, Josef; and Oellerer, Friedrich, 4,249,467, Cl. 104-3.000.

Frazier, Terry L., to Texaco Inc. Recovery method for high viscosity petroleum. 4,249,604, Cl. 166-263.000.

Fredericks, Glen R.: *See—*
Hochstetler, Alan R.; Fredericks, Glen R.; and Golle, Erlinda F., 4,250,061, Cl. 252-522.00R.

Freeborn, John O.: *See—*
Gray, Geoffrey I.; and Freeborn, John O., 4,250,397, Cl. 219-345.000.

Freeman, Bert: *See—*
Haselbauer, Gene R.; and Freeman, Bert, 4,249,706, Cl. 242-84.21R.

Freeman, James D. Length-adjustable stiffener for fiberboard ducts. 4,249,578, Cl. 138-172.000.

Freeman, Lawrence M.; and Arnold, Francis T. Registration control system for copy machine. 4,249,820, Cl. 355-29.000.

Frei, Siegfried: *See—*
Opprecht, Paul; and Frei, Siegfried, 4,249,476, Cl. 118-204.000.

Freilich, Alfred: *See—*
DeCristofaro, Nicholas J.; Freilich, Alfred; and Nathasingh, Davidson M., 4,249,969, Cl. 148-108.000.

French, Floyd R., to Dow Chemical Company, The. Leak-proof sprayer. 4,249,681, Cl. 222-380.000.

Frey, Robert J.: *See—*
Graninger, Frank J.; and Frey, Robert J., 4,250,477, Cl. 335-169.000.

Friello, Dominick R., to Life Savers, Inc. Center-filled chewing gums. 4,250,196, Cl. 426-5.000.

Friello, Dominick R.: *See—*
Cherukuri, Subraman R.; and Friello, Dominick R., 4,250,195, Cl. 426-5.000.

Friggstad Manufacturing Ltd.: *See—*
Friggstad, Terrance, 4,249,615, Cl. 172-266.000.

Friggstad, Terrance, to Friggstad Manufacturing Ltd. Two-stage trip release shank assembly. 4,249,615, Cl. 172-266.000.

Frisk, Lennart J. F., to Tretorn Aktiebolag. Tennis ball comprising a hollow sphere of a rubber containing filler. 4,249,730, Cl. 273-61.00C.

Fritz, Ernst: *See—*
Knuppel, Helmut; Brotzmann, Karl; Fassbinder, Hans-Georg; and Fritz, Ernst, 4,249,719, Cl. 266-47.000.

Froumajou, Armand, to Automobiles Peugeot; and Societe Anonyme Automobiles Citroen. Front set of wheels for an automobile vehicle. 4,249,753, Cl. 280-673.000.

Fuji Photo Film Co., Ltd.: *See—*
Itoh, Isamu; and Yoshida, Yoshinobu, 4,250,246, Cl. 430-223.000.
Shirahata, Ryuji; Kitamoto, Tatsuji; Suzuki, Masaaki; and Amari, Hiroshi, 4,250,225, Cl. 428-336.000.
Yoshida, Takashi; and Sakaguchi, Shinji, 4,250,243, Cl. 430-215.000.

Fuji Photo Film Corporation: *See*—
Kondo, Asaji; Kitajima, Masao; and Hatanaka, Isamu, 4,250,010, Cl. 204-195.00M.
Fujii, Toshihiko, to Nissan Motor Company, Limited. Method and apparatus for production of laminated and shaped trim panel of corrugated paperboard base. 4,249,983, Cl. 156-475.000.
Fujioka, Hironari, to Kanzaki Paper Manufacturing Co., Ltd. Electrostatic record element of electroconductive base sheet coated with resin layer containing ZnO powder of specified resistivity. 4,250,228, Cl. 428-539.000.
Fujita, Kiyoshi; Ito, Yukiyoshi; and Kamimori, Shigeru, to Kyowa Yuka Co., Ltd. Method for separation of an ester from a reaction mixture. 4,250,328, Cl. 560-205.000.
Fujitsu Limited: *See*—
Kawashima, Masao; Okada, Hisanao; and Kikuchi, Bun, 4,249,925, Cl. 65-3.00A.
Mogi, Junichi; and Miyasaka, Kiyoshi, 4,250,519, Cl. 357-41.000.
Sasaki, Nobuo; Nakano, Moto'o; Kobayashi, Yasuo; and Iwai, Takashi, 4,250,569, Cl. 365-185.000.
Fukuoka, Yohei: *See*—
Nishikido, Joji; Tamura, Nobuhiro; Fukuoka, Yohei; and Yamane, Hiroyuki, 4,250,110, Cl. 564-156.000.
Fukuzaki, Fukushichi; Ishii, Yoshio; and Fukuzawa, Masaki, to Kabushiki Kaisha Ohara Kogaku Garasu Seizosho. Method and apparatus for manufacturing glass products by controlling free flow of low viscosity molten glass. 4,249,927, Cl. 65-75.000.
Fukuzawa, Masaki: *See*—
Fukuzaki, Fukushichi; Ishii, Yoshio; and Fukuzawa, Masaki, 4,249,927, Cl. 65-75.000.
Fumagalli, Angelo: *See*—
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Alessandro; Fumagalli, Angelo; Faustini, Franco; Ceserani, Roberto; and Usardi, Maria M., 4,250,188, Cl. 424-285.000.
Funk, Gary L., to Phillips Petroleum Company. Temperature control of exothermic reactions. 4,249,908, Cl. 23-230.00A.
Fuqua, Dale: *See*—
Slater, Frank W.; and Fuqua, Dale, 4,249,605, Cl. 166-266.000.
Furukawa, Mitsuhiko: *See*—
Ogawa, Kazuki; Furukawa, Mitsuhiko; Hara, Yoshimichi; and Kitahira, Takashi, 4,249,914, Cl. 51-309.000.
Furukawa, Yasuyoshi: *See*—
Suzuki, Takeshi; Furukawa, Yasuyoshi; Tomoda, Masayasu; Ueta, Yutaka; and Ohmori, Akira, 4,250,278, Cl. 525-340.000.
Furuta, Yoko: *See*—
Tanaka, Chiaki; Naito, Nagayoshi; and Furuta, Yoko, 4,250,280, Cl. 525-437.000.
Futaba Kinzoku Kogyo Kabushiki Kaisha: *See*—
Nishimura, Tamotsu, 4,249,761, Cl. 292-251.500.
Futatsuka, Rensei; and Sakakibara, Tadao, to Tamagawa Kikai Kinzoku Kabushiki Kaisha. Copper base alloy for leads of integrated circuit. 4,249,941, Cl. 75-153.000.
Fuwa, Jyoichi; and Asakawa, Toshifumi, to Ricoh Company, Ltd. Optical information reading device. 4,250,526, Cl. 358-294.000.
G. D. Searle & Co.: *See*—
Krzeminski, Melvin L., 4,249,525, Cl. 128-130.000.
Ga-Vehren Engineering Company: *See*—
VerMehren, Hubert R., 4,249,984, Cl. 156-552.000.
Gabbay, Emile; Tran Quand, Dang; and Lafitte, Andre, to Compagnie Generale de Radiologie. Rotating anode X-ray tube for tomodensitometers. 4,250,425, Cl. 313-60.000.
Gabrielidis, Pericles. Tennis exercise aid. 4,249,729, Cl. 273-29.00A.
Gaertner, Max, to Fischer & Porter Company. Integrator having dropout circuit. 4,250,557, Cl. 364-605.000.
GAF Corporation: *See*—
Chandler, Herman, 4,250,064, Cl. 260-17.4CL.
Gaida, Wolfram: *See*—
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Hoefke, Wolfgang; Gaida, Wolfram; and Pichler, Ludwig, 4,250,186, Cl. 424-273.00R.
Gaiser, Robert F.; and Lohraff, Larry G., to Bendix Corporation, The. Fluid pressure generator and valve member therefor. 4,249,379, Cl. 60-562.000.
Gaiser, Robert F., to Bendix Corporation, The. Master cylinder. 4,249,381, Cl. 60-562.000.
Gambino, Richard J.: *See*—
Cuomo, Jerome J.; Gambino, Richard J.; Harper, James M.; and Kupstis, John D., 4,250,009, Cl. 204-192.00N.
Gambro Dialysatoren GmbH & Co. KG: *See*—
Lehmann, Hans-Dieter; and Konstantin, Peter, 4,250,141, Cl. 422-44.000.
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Alessandro; Fumagalli, Angelo; Faustini, Franco; Ceserani, Roberto; and Usardi, Maria M., to Farmitalia Carlo Erba S.p.A. Certain PGI_1 compounds and pharmaceutical compositions containing them. 4,250,188, Cl. 424-285.000.
Gardiner, James R.; Pliskin, William A.; Revitz, Martin; and Shepard, Joseph F., to International Business Machines Corporation. Method of manufacturing a metal-insulator-semiconductor utilizing a multiple stage deposition of polycrystalline layers. 4,249,968, Cl. 148-174.000.
Gardinier, Inc.: *See*—
Kouloheris, Anastasios P.; and LeFever, JoAnne, 4,250,155, Cl. 423-321.00R.
Gardner, Jeffrey M., to Container Corporation of America. Partition structure. 4,249,691, Cl. 229-15.000.
Gashenko, Stanislav I.: *See*—
Kalmykov, Vladimir N.; Musiiko, Vitaly A.; Khlopkov, Leonid P.; Gashenko, Stanislav I.; Rogatkin, Alexandr A.; Silakov, Grigory I.; Shipilov, Viktor F., deceased; Skibina, Elena S., administrator; Shipilov, Gennady V., administrator; and Shipilov, Fedor D., administrator, 4,249,989, Cl. 159-10.000.
Gasparik, Frank, to Harris Corporation. Slew rate control. 4,250,460, Cl. 330-252.000.
Gatschmann, Klaus: *See*—
Heil, Richard; Gatschmann, Klaus; and Wieshofer, Anton, 4,249,546, Cl. 131-70.000.
Gaughan, Edmund J., to Stauffer Chemical Company. 1-(3,5-Dichlorobenzoyl)-3-phenylpyrazolines and their use as mildewicides. 4,250,185, Cl. 424-273.00P.
Gaunaurd, Guillermo C.; Uberall, Herbert M.; and Scharnhorst, Kurt P., to United States of America, Navy. Method to determine the shear absorption of a rubberlike material. 4,249,421, Cl. 73-589.000.
Gaunaurd, Guillermo C.; and Uberall, Herbert M., to United States of America, Navy. Apparatus and process for determining the composition of fluid-filled cavities. 4,249,422, Cl. 73-589.000.
Gauss, James C.: *See*—
Damrau, Wayne A.; and Gauss, James C., 4,250,211, Cl. 427-356.000.
Gdovichin, George G., to JAB Company, Incorporated. Speed sensor switch. 4,250,359, Cl. 200-80.00R.
Gefter, Semen E.: *See*—
Kaluzhsky, Nikolai A.; Gefter, Semen E.; Tsybukov, Igor K.; Evdokimov, Svetozar V.; Derkach, Alexei S.; Tsyplakov, Anatoly M.; Lankin, Valery P.; Velichko, Boris P.; Kostin, Albert A.; Volfson, Grigory E.; and Nikiforov, Vladimir P., 4,250,012, Cl. 204-243.00M.
Gehin, Guy; and Fage, Eva, to Eastman Kodak Company. Control of dye release in color transfer assemblages using blocked competing developers. 4,250,245, Cl. 430-218.000.
Gella, Teresa M. Art and educational book. 4,249,757, Cl. 281-15.00R.
Gelse, Hans-Dieter; Heger, Werner; and Kramer, Manfred, to WABCO Westinghouse GmbH. Valve mount for a compressor pressure valve. 4,249,564, Cl. 137-340.000.
Gemba, Tomoji, to Tokyo Shibaura Electric Co., Ltd. Circuit board having printed thereon conductive patterns to be connected with input and output lead wires of acoustic surface wave filter element. 4,250,473, Cl. 333-193.000.
General Electric Company: *See*—
Alley, Robert P.; and Weischedel, Richard C., 4,250,435, Cl. 318-138.000.
Alley, Robert P., 4,250,544, Cl. 364-110.000.
Barringer, Jerry M.; and Harris, Raymond W., 4,250,536, Cl. 361-413.000.
Bartholomew, John T., 4,249,977, Cl. 156-288.000.
Butler, Walter J.; and Eichelberger, Charles W., 4,250,494, Cl. 340-347.0CC.
Crivello, James V., 4,250,311, Cl. 546-9.000.
Eichelberger, Charles W., 4,250,504, Cl. 340-758.000.
Grondahl, Clayton M.; Willmott, Leo C.; and Muth, Myron C., 4,249,291, Cl. 29-156.80H.
Harlow, James L.; and Karns, Ward L., 4,250,513, Cl. 346-153.100.
Janu, Maria M., 4,250,388, Cl. 250-468.000.
Kazamir, Raymond, 4,250,443, Cl. 320-2.000.
Petersen, Louis P., 4,250,290, Cl. 528-14.000.
Potochnik, Frank S., 4,249,486, Cl. 122-451.00R.
Viertl, John R. M.; and Jones, Marshall G., 4,249,423, Cl. 73-783.000.
White, Loren H., 4,249,372, Cl. 60-39.320.
Young, William R., 4,249,963, Cl. 148-16.000.
Zolman, Charles T., 4,250,419, Cl. 310-68.00C.
General Electric Company Limited, The: *See*—
Bloodworth, Greville G.; and Manley, Martin H., 4,250,518, Cl. 357-27.000.
General Foods, Limited: *See*—
Millar, Donald B.; Murray, Edward D.; and Maurice, Terrence J., 4,250,198, Cl. 426-335.000.
General Housewares Corp.: *See*—
Mayer, Morrie M., 4,250,215, Cl. 428-35.000.
General Motors Corporation: *See*—
Carey, Van P., 4,249,597, Cl. 165-166.000.
Gergoe, Bela; and Sarosy, Edmund F., 4,249,771, Cl. 296-146.000.
Kimberlin, Dan R., 4,249,404, Cl. 70-248.000.
Kotwicki, Allan J., 4,249,416, Cl. 73-133.00R.
Siegla, Donald C., 4,249,488, Cl. 123-90.160.
Watson, Richard D., 4,249,425, Cl. 474-110.000.
General Signal Corporation: *See*—
Polimine, Robert F., 4,250,350, Cl. 174-86.000.
Werych, Ewald R., 4,249,888, Cl. 432-3.000.
George, John A. Reliable trap filling device for siphon apparatus. 4,249,559, Cl. 137-124.000.
Gerber Scientific Instrument Company, The: *See*—
Webster, Ronald B.; and Larsen, Ronald P., 4,249,807, Cl. 354-4.000.
Webster, Ronald B., 4,249,808, Cl. 354-4.000.
Gergoe, Bela; and Sarosy, Edmund F., to General Motors Corporation. Manually operated actuator arrangement. 4,249,771, Cl. 296-146.000.
Giambalvo, Joseph. Folding picnic table. 4,249,773, Cl. 297-159.000.
Giannini, Umberto; Albizzati, Enrico; and Parodi, Sandro, to Montedison S.p.A. Catalyst-forming components for preparing catalysts useful in the polymerization of olefins. 4,250,104, Cl. 260-448.0AD.
Gibson, David E.: *See*—
Connolly, John R.; Gibson, David E.; Heimark, Edward L.; Quinn, Jerome B.; Speechley, Richard E.; and Winter, Richard L., 4,249,863, Cl. 416-185.000.

Giddings, John C.; and Myers, Marcus N., to University of Utah. Continuous steric FFF device for the size separation of particles. 4,250,026, Cl. 209-155.000.

Giddings & Lewis, Inc.: *See—*
Paveglio, Gerald E., Jr.; Poehlman, Lawrence C.; and Werdin, Richard L., 4,250,551, Cl. 364-474.000.

Giebel, Gerhard, to USM Corporation. Shoe backpart molding machine. 4,249,279, Cl. 12-54.300.

Gilbert, Allan F.; and Rapson, W. Howard, to ERCO Envirotech Ltd. Process for removal of potassium values from pulp mill liquors. 4,249,990, Cl. 162-17.000.

Gilbertson, Gary G., to Brunswick Corporation. Control unit for marine engines employing safety stop switch. 4,250,358, Cl. 200-52.00R.

Gillette, John E.: *See—*
Christenson, Larry E.; Dripps, Rick W.; Gillette, John E.; and Mittleberg, Mark S., 4,249,461, Cl. 98-38.00R.

Giordano, Vittorio: *See—*
Capello, Giuseppe; Giordano, Vittorio; and Biondi, Renato, 4,250,011, Cl. 204-224.00M.

Girard, Francois: *See—*
Bernard, Claude R.; Daigne, Bernard; and Girard, Francois, 4,250,433, Cl. 315-335.000.

Girsch, David E.: *See—*
Clifford, Jimmie D.; Girsch, David E.; and Magruder, Michael K., 4,249,558, Cl. 137-115.000.

Givaudan Corporation: *See—*
Hochstetler, Alan R.; Fredericks, Glen R.; and Golle, Erlinda F., 4,250,061, Cl. 252-522.00R.
Kaiser, Roman, 4,250,062, Cl. 252-522.00R.
Kaiser, Roman, 4,250,099, Cl. 260-346.220.

GKD Gebr. Kufferath GmbH & Co. KG: *See—*
Kufferath-Kassner, Karl, 4,249,653, Cl. 198-848.000.

Glasgow, David A. Tripod stepladder. 4,249,637, Cl. 182-170.000.

Glass Containers Corporation: *See—*
Ali-Zaidi, Syed R., 4,250,068, Cl. 260-28.50R.

Glassmeyer, John J., to Pullman Incorporated. Wheel hub structure with bearing lubrication. 4,249,783, Cl. 308-187.000.

Glazier, William J. Variable throw eccentric. 4,249,424, Cl. 74-25.000.

Glover, Clinton G.: *See—*
Keller, Harold A.; and Glover, Clinton G., 4,249,508, Cl. 124-80.000.

Glynn, John H.; and Glynn, Patrick J. Roof attachment member for safety lines. 4,249,713, Cl. 248-237.000.

Glynn, Patrick J.: *See—*
Glynn, John H.; and Glynn, Patrick J., 4,249,713, Cl. 248-237.000.

Godbersen, Byron L. Miniature airplane motor mounting structure. 4,249,711, Cl. 244-54.000.

Godeke, Henning, to Wilhelm Abt GmbH & Co. KG. Garden fork. 4,249,764, Cl. 294-55.500.

Goedecke, Ralf; Liebert, Martin; Nischk, Wolfgang; Kurandt, Uwe; and Mewes, Dieter, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the recovery of solid cyanuric chloride (A). 4,250,308, Cl. 544-190.000.

Goens, Duane N.: *See—*
Ruskin, Richard P.; Zafar, Humayon Z.; Goens, Duane N.; Hyatt, David E.; and Kenney, Charlie W., 4,250,157, Cl. 423-417.000.

Goetz, Norbert: *See—*
Buschmann, Ernst; Goetz, Norbert; Zeeh, Bernd; and Varwig, Juergen, 4,250,123, Cl. 260-185.000.

Goff, James R. Abrasive throwing wheel and improved blade assembly. 4,249,350, Cl. 51-434.000.

Gohrbandt, Wilhelm: *See—*
Hugl, Herbert; Wolfrum, Gerhard; Reel, Henning; Kunnel, Werner; Kuth, Robert; and Gohrbandt, Wilhelm, 4,249,275, Cl. 8-532.000.

Goldberger, William M.: *See—*
Parekh, Bhupendra K.; and Goldberger, William M., 4,249,700, Cl. 241-24.000.

Golden, Ronald; Kulaga, Matthew S.; and Shatynski, Stephen, to Borden, Inc. Foundry molding compositions. 4,250,076, Cl. 260-38.000.

Goldfarb, Adolph E.; and Everitt, Delmar K., to Goldfarb, Adolph E. Toy hovercraft apparatus. 4,249,334, Cl. 46-1.00J.

Golle, Erlinda F.: *See—*
Hochstetler, Alan R.; Fredericks, Glen R.; and Golle, Erlinda F., 4,250,061, Cl. 252-522.00R.

Goodrich, Gordon W., to Oreck Corp. Vacuum cleaner bag attachment. 4,249,280, Cl. 15-323.000.

Goodyear Tire & Rubber Company, The: *See—*
Egan, William E., 4,249,588, Cl. 152-357.00R.

Gorbaty, Martin L.: *See—*
Long, Robert B.; Gorbaty, Martin L.; and Vernon, Lonnie W., 4,250,014, Cl. 208-8.0LE.

Gordon, Joseph G., II: *See—*
Sincerbox, Glenn T.; and Gordon, Joseph G., II, 4,249,796, Cl. 350-370.000.

Goretta, Louis A.: *See—*
Seale, Virgil L.; and Goretta, Louis A., 4,250,111, Cl. 564-129.000.

Gorman, Joseph G.: *See—*
Kimblin, Clive W.; Holmes, Francis A.; Heberlein, Joachim V. R.; Gorman, Joseph G.; and Slade, Paul G., 4,250,364, Cl. 200-144.00B.

Gorvin, John H., to Burroughs Wellcome Co. Pharmaceutical composition containing acridone compounds and method of using same. 4,250,182, Cl. 424-257.000.

Goser, Karl, to Siemens Aktiengesellschaft. Electronic control system for analog circuits. 4,250,556, Cl. 364-600.000.

Gotou, Shuichi: *See—*
Sasaki, Masayuki; and Gotou, Shuichi, 4,250,370, Cl. 219-10.55B.

Gott, Hans; Ritter, Josef; Ritter, Klaus; Ritter, Gerhard; and Schmidt, Gerhard, to EvG Entwicklungs-u. verwertungs-GmbH. Wire picking from a wire bundle. 4,249,841, Cl. 414-14.000.

Gould Inc.: *See—*
Davis, Lee A., 4,250,532, Cl. 361-96.000.

Gouret, Claude G.: *See—*
Dostert, Philippe L.; Douzon, Colette A.; Bourgery, Guy R.; Gouret, Claude G.; Mocquet, Gisele C.; and Coston, Jean-Alain, 4,250,318, Cl. 548-229.000.

Goyert, Wilhelm: *See—*
Niederdellmann, Georg; Goyert, Wilhelm; Meisert, Ernst; Eitel, Alfred; Wagner, Hans; and Hespe, Hans, 4,250,292, Cl. 528-44.000.

Grab, George P.; Hood, Grant W., Jr.; Swanson, Sigurd A.; and Nemeth, Bela J., to Kennametal Inc. Flowable composition adapted for sintering and method of making. 4,249,955, Cl. 106-308.00Q.

Grabber, Inc.: *See—*
Pratt, Lindsay L., 4,249,344, Cl. 47-76.000.

Grabiak, Raymond C., to Monsanto Company. Process for producing substituted benzoxaphospholes. 4,250,320, Cl. 556-404.000.

Graboyes, Herman A.; and Miller, Simon R., Jr. Ruled scoring die. 4,249,432, Cl. 76-107.00C.

Grah, Neil E.; and Weaver, Robert F., to Emhart Industries, Inc. Sandwich structure for a combination motor and gear train with a timing mechanism. 4,250,420, Cl. 310-83.000.

Graham, Anne M.: *See—*
Pesa, Frederick A.; and Graham, Anne M., 4,250,093, Cl. 260-239.30A.

Graham, Johnny R.: *See—*
Graham, Kenneth Z.; and Graham, Johnny R., 4,249,284, Cl. 17-52.000.

Graham, Kenneth P., to K. P. Graham & Associates Pty. Ltd. Production of heated bituminous mixes. 4,249,890, Cl. 432-13.000.

Graham, Kenneth Z.; and Graham, Johnny R. Poultry gizzard processing system. 4,249,284, Cl. 17-52.000.

Graham, Thomas E.; Thaxton, George H.; Mitchell, Francis M.; and Bell, Robert P., to Monsanto Company. Method for producing an adhesive-coated high-strength steel reinforcing member. 4,250,226, Cl. 428-344.000.

Granda, Edward J.: *See—*
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,250,194, Cl. 426-3.000.
Trenkle, Robert W.; Mookherjee, Braja D.; Hall, John B.; Kasper, Robin; Vock, Manfred H.; Schreck, Ronald; Granda, Edward J.; and Vinals, Joaquin F., 4,250,332, Cl. 568-347.000.

Grandini, Angelo: *See—*
Cardone, Michele; Grandini, Angelo; and Zaramella, Bruno, 4,250,478, Cl. 335-288.000.

Graninger, Frank J.; and Frey, Robert J., to Allen-Bradley Company. Mechanical latch apparatus. 4,250,477, Cl. 335-169.000.

Grass, Arnold: *See—*
Schlatter, Reinhard; and Grass, Arnold, 4,250,220, Cl. 428-212.000.

Grassl, Gerhard, to Siemens Aktiengesellschaft. Capacitor semiconductor storage circuit. 4,250,568, Cl. 365-149.000.

Gray, Geoffrey I.; and Freeborn, John O., to International Paper Company. Heating element and methods of manufacturing therefor. 4,250,397, Cl. 219-345.000.

Gray, Randall C.; and Pace, W. David, to Motorola, Inc. Pressure sensitive transducer circuits. 4,250,452, Cl. 328-1.000.

Greber, Gerd: *See—*
Kvita, Vratislav; Zweifel, Hans; and Greber, Gerd, 4,250,096, Cl. 260-326.00N.

Greenaway, David L., to LGZ Landis & Gyr Zug AG. Documents embossed with machine-readable information by means of an embossing foil. 4,250,217, Cl. 428-161.000.

Greenaway, David L., to LGZ Landis & Gyr Zug AG. Photoelectric apparatus for detecting altered markings. 4,250,393, Cl. 250-566.000.

Greene, Neil E.; and Srinivasan, Seshadri, to Owens-Corning Fiberglas Corporation. Method and apparatus for processing heat-softenable fiber forming material. 4,249,398, Cl. 65-1.000.

Greene, Norman D., to Kohler Co. High temperature, heat storage and retrieval system. 4,249,592, Cl. 165-1.000.

Greenley, Gordon A.: *See—*
Haag, George A.; Fogg, Douglas; Greenley, Gordon A.; Shepard, Steve A.; and Terry, F. Duncan, 4,250,562, Cl. 364-900.000.

Greenwood, William S.: *See—*
Weinmann, Karl; Kuo, Ted L. C.; and Greenwood, William S., 4,249,303, Cl. 29-868.000.

Greer, Henry R. Outdoor well depth indicator. 4,249,598, Cl. 166-54.000.

Gretz, Heinz; Rudszinat, Willy; and Lorenzen, Heinz-Christen, to Hauni-Werke Korber & Co. KG. Method and apparatus for perforating the envelopes of filter cigarettes or the like. 4,249,545, Cl. 131-21.00R.

Grier, Nathaniel; Dybas, Richard A.; and Witzel, Bruce E., to Merck & Co., Inc. Treatment of pain, fever, and inflammation with compositions containing piperidinobutan-and 3-buten-2-ones. 4,250,184, Cl. 424-267.000.

Griffin, Cecil A.; and Des Jarlais, Gerald J. Transportable, collapsible vehicle loading hopper. 4,249,848, Cl. 414-332.000.

Groman, Ernest V., to Baxter Travenol Laboratories, Inc. Protein binding method. 4,250,162, Cl. 424-1.000.

Grondahl, Clayton M.; Willmott, Leo C.; and Muth, Myron C., to General Electric Company. Method for forming a liquid cooled airfoil for a gas turbine. 4,249,291, Cl. 29-156.80H.

Grudzinskas, Charles V.: *See*—
Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-Mei L., 4,250,325, Cl. 560-121.000.

Gruener, Rolf. Controller for curtain coater. 4,249,478, Cl. 118-668.000.

Grumman Aerospace Corporation: *See*—
Hudson, Gordon F., 4,249,976, Cl. 156-286.000.
Leib, Kenneth G., 4,250,465, Cl. 331-94.50D.

Grundmann, Edgard; Herbst, Udo; and Pommerenke, Horst, to Volkswagenwerk Aktiengesellschaft. Heat exchanger. 4,249,375, Cl. 60-309.000.

Gruner, Peter: *See*—
Otzen, Uwe; and Gruner, Peter, 4,249,709, Cl. 242-107.300.

Gschwend, Norbert: *See*—
Bahler, Andre; Gschwend, Norbert; and Scheier, Heinrich, 4,249,270, Cl. 3-1.911.

Guarnery, Joseph M.; and Kester, Dennis E., to American Can Company. Polymerizable coating composition containing polymerizable epoxide compound and vinyl chloride dispersion polymer and method of coating utilizing same and coated articles produced thereby. 4,250,006, Cl. 204-159.180.

Gude, Fritz; and Brandt, Siegfried, to Veba Chemie Aktiengesellschaft. Melt adhesive based on polyamide from branched chain diamine. 4,250,291, Cl. 528-338.000.

Gueret, Jean-Louis H., to L'Oreal. Implement for massaging the cutaneous covering. 4,249,521, Cl. 128-62.00R.

Guerra, Frank J., to Resina Automatic Machinery Co. Inc. Clutch construction for capping machine quill assembly. 4,249,397, Cl. 64-29.000.

Guipaud, Serge C., to Societe pour l'Equipement de Vehicules. Internal combustion engine ignition systems. 4,249,494, Cl. 123-425.000.

Guiter, Jack L.: *See*—
Dolberg, Dale R.; and Guiter, Jack L., 4,249,366, Cl. 56-98.000.

Gulf Canada Limited: *See*—
Johnson, Herbert S., 4,250,151, Cl. 423-230.000.

Gulley, Rinda S.: *See*—
Dobbs, Fred J.; Taylor, Marshall W.; and Gulley, Rinda S., 4,249,710, Cl. 242-199.000.

Gunnerman, Rudolf W. Method and apparatus for burning pelletized organic fibrous fuel. 4,249,471, Cl. 110-243.000.

Gurtler, Richard W.: *See*—
Cota, Marlo E.; and Gurtler, Richard W., 4,250,148, Cl. 422-246.000.

Gustafson, Darryl E.: *See*—
Hilbert, Robert S.; Gustafson, Darryl E.; Harris, Thomas I.; and Rimmer, Matthew P., 4,249,805, Cl. 352-85.000.

Gutehoffnungshutte Sterkrade Aktiengesellschaft: *See*—
Kammerling, Bruno; and Kubbutat, Axel, 4,249,723, Cl. 266-193.000.

Guzzi, Louis A. Method and apparatus for preventing ice formation at the entrance portal of a mine. 4,249,462, Cl. 98-50.000.

Gwozdz, Kenneth J.: *See*—
Sherwin, Martin B.; Peress, Jimmy Y.; and Gwozdz, Kenneth J., 4,250,344, Cl. 585-437.000.

Gysegem, Albert P.: *See*—
Foscante, Raymond E.; Gysegem, Albert P.; Martinich, Pamela J.; and Law, Gabriel H., 4,250,074, Cl. 260-32.8EP.

H. C. Price Co.: *See*—
Christie, Howard W.; and Hodge, Walter D., 4,249,477, Cl. 118-/413.000.

Haafkens, Rudolf; Luque, Rafael F.; and De Vries, Willem, to Shell Internationale Research Maatschappij B.V. Method for forming channels of high fluid conductivity in formation parts around a borehole. 4,249,609, Cl. 166-280.000.

Haag, George A.; Fogg, Douglas; Greenley, Gordon A.; Shepard, Steve A.; and Terry, F. Duncan, to Hewlett-Packard Company. Digital signal state analyzer and display. 4,250,562, Cl. 364-900.000.

Haass, Adolf, to Siemens Aktiengesellschaft. Circuit arrangement for automatic distortion correction of a signal. 4,250,459, Cl. 330-145.000.

Habiger, Cyril W., to Caterpillar Tractor Co. Load resolver. 4,249,557, Cl. 137-112.000.

Hachinohe Smelting Co., Ltd.: *See*—
Koga, Haruyoshi, 4,249,947, Cl. 106-57.000.

Hackforth GmbH & Co. KG: *See*—
Walter, Jurgen, 4,249,394, Cl. 64-11.00R.

Hagedorn, Myrna L.: *See*—
Sprecker, Mark A.; Sanders, James M.; Schreiber, William L.; Watkins, Hugh; Vinals, Joaquin F.; Shuster, Edward J.; O'Rourke, Thomas J.; Hagedorn, Myrna L.; and Klemarczyk, Philip, 4,250,338, Cl. 568-343.000.

Hagel, Rainer; and Redecker, Klaus, to Dynamit Nobel Aktiengesellschaft. Polymers obtained from polynitroaromatic compounds. 4,250,294, Cl. 528-210.000.

Hagenson, Leo J. Automatic mat cutting machine. 4,249,437, Cl. 83-39.000.

Hagopian, Arpi: *See*—
Carlo, Dennis J.; Hagopian, Arpi; and Kniskern, Peter J., 4,250,265, Cl. 435-272.000.

Haley, Frank P., to FMC Corporation. Optically coupled remote control system. 4,249,794, Cl. 350-96.200.

Hall, John B.: *See*—
Trenkle, Robert W.; Mookherjee, Braja D.; Hall, John B.; Kasper, Robin; Vock, Manfred H.; Schreck, Ronald; Granda, Edward J.; and Vinals, Joaquin F., 4,250,332, Cl. 568-347.000.

Hall, Jon F. Double format still camera. 4,249,812, Cl. 354-120.000.

Hall, Michael J.: *See*—
Atherton, Frank R.; Hall, Michael J.; Hassall, Cedric H.; Lambert, Robert W.; and Ringrose, Peter S., 4,250,085, Cl. 260-112.50R.

Halliburton Company: *See*—
Streich, Steven G.; Knox, L. Carter; and Sullaway, Bob L., 4,249,576, Cl. 138-89.000.

Hallmark Cards Incorporated: *See*—
Beery, Floyd T., 4,249,676, Cl. 222-321.000.

Halm, Hans, to Confon AG. Data register. 4,249,662, Cl. 209-610.000.

Hamed, Gary R.: *See*—
Bohm, Georg G. A.; Hamed, Gary R.; and Vescelius, Lee E., 4,250,273, Cl. 525-99.000.

Hamilton, Harold V.: *See*—
Melendy, Harold A.; and Hamilton, Harold V., 4,249,380, Cl. 60-562.000.

Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Label printing and applying apparatus. 4,249,973, Cl. 156-216.000.

Hammer, Victor S., Jr.; and Swick, E. Grant, to Illinois Tool Works Inc. Telephone cradle. 4,250,356, Cl. 179-146.00R.

Hammerstrom, Knut: *See*—
Lehmann, Wolfgang; Muller, Friedhelm; Lobach, Wilfried; Cramm, Gunther; and Hammerstrom, Knut, 4,250,298, Cl. 528-342.000.
Lehmann, Wolfgang; Muller, Friedhelm; Cramm, Gunther; Hammerstrom, Knut; and Lobach, Wilfried, 4,250,299, Cl. 528-342.000.

Hanai, Satoshi: *See*—
Takahashi, Hisashi; Hanai, Satoshi; and Yoshida, Katsuyoshi, 4,250,207, Cl. 427-211.000.

Hancherick, Kenneth J., to Concorde Manufacturing Company. Amusement device. 4,249,737, Cl. 273-143.00R.

Hanke, Kenneth E., to Kearney-National, Inc. Fuse mounting. 4,250,357, Cl. 200-50.00A.

Hanley, Robert S.: *See*—
Crosby, Jeffrey N.; and Hanley, Robert S., 4,250,210, Cl. 427-252.000.

Hans Sickinger Co.: *See*—
Pfaffle, Ernst, 4,249,278, Cl. 11-1.00A.

Hansen, Guenter: *See*—
Eilingsfeld, Heinz; Hansen, Guenter; Seybold, Guenther; and Zeidler, Georg, 4,250,090, Cl. 260-158.000.

Hansen, Hanspeter; Eicken, Karl; and Wuerzer, Bruno, to BASF Aktiengesellschaft. Herbicidal agents containing a thiolcarbamate. 4,249,933, Cl. 71-88.000.

Hansen, Hanspeter; Eicken, Karl; and Wuerzer, Bruno, to BASF Aktiengesellschaft. Herbicidal agents. 4,249,935, Cl. 71-92.000.

Hansen, James D., Jr., to United States of America, Navy. Safety selector switch. 4,250,379, Cl. 250-229.000.

Hansen, Larry J. Microwave meal rack. 4,249,464, Cl. 99-450.000.

Hapgood, William W.; and Krimetz, Wasyl, to University of California, The Regents of the. Laboratory bench for handicapped students. 4,249,785, Cl. 312-196.000.

Hara, Akinori, to Osawa Press Mfg. Co., Ltd. Sheathed wire end portion processing machine. 4,249,433, Cl. 81-9.510.

Hara, Yoshimichi: *See*—
Ogawa, Kazuki; Furukawa, Mitsuhiko; Hara, Yoshimichi; and Kitahira, Takashi, 4,249,914, Cl. 51-309.000.

Haran, Raymond: *See*—
Constant, Georges; Haran, Raymond; Lebugle, Albert; Zaouk, Aref; Morancho, Roland; and Pouvreau, Philippe, 4,250,205, Cl. 427-87.000.

Hardinge Brothers, Inc.: *See*—
Andrews, Earl C., 4,249,748, Cl. 279-46.00R.

Hargest, Thomas S., III. Gastric feeding device. 4,249,535, Cl. 128-348.000.

Harlow, James L.; and Karns, Ward L., to General Electric Company. Linear vertical adjustment mechanism. 4,250,513, Cl. 346-153.100.

Harper, James M.: *See*—
Cuomo, Jerome J.; Gambino, Richard J.; Harper, James M.; and Kupstis, John D., 4,250,009, Cl. 204-192.00N.

Harr, James R. Air conditioned laboratory rack for animal cages. 4,249,482, Cl. 119-17.000.

Harris Corporation: *See*—
Collins, Gerald W., 4,250,509, Cl. 343-806.000.
Gasparik, Frank, 4,250,460, Cl. 330-252.000.

Harris, Marion K. Isothermal compression-regenerative method for operating vapor cycle heat engine. 4,249,384, Cl. 60-670.000.

Harris, Raymond W.: *See*—
Barringer, Jerry M.; and Harris, Raymond W., 4,250,536, Cl. 361-413.000.

Harris, Robert H., to Robert H. Harris Company, Inc. Ductwork connecting. 4,249,758, Cl. 285-158.000.

Harris, Thomas I.: *See*—
Hilbert, Robert S.; Gustafson, Darryl E.; Harris, Thomas I.; and Rimmer, Matthew P., 4,249,805, Cl. 352-85.000.

Hart, Edward; and Rutledge, Raleigh N., to Cosden Technology, Inc. Co-extrusion apparatus and method for producing multiple-layered thermoplastic pipe. 4,249,875, Cl. 425-133.100.

Hartdegen, Frank J.; and Swann, Wayne E., to W. R. Grace & Co. Immobilized biological material. 4,250,267, Cl. 435-317.000.

Hartman, Charles N. Method of removing paint from a brick surface. 4,249,956, Cl. 134-7.000.

Hartnett, Deborah I., to ICI Americas Inc. Cake compositions containing high fructose corn syrup. 4,250,202, Cl. 426-553.000.

Harumi, Kenichi: *See—*
Musha, Toshimitsu; Harumi, Kenichi; Teramachi, Yasuaki; and Kanou, Toshiyuki, 4,249,538, Cl. 128-630.000.

Harvey, Andrew C.; and Burnett, Mackenzie, to Foster-Miller Associates, Inc. Sealed flight screw injector. 4,249,838, Cl. 406-51.000.

Harz, Peter: *See—*
Krude, Werner; and Harz, Peter, 4,249,395, Cl. 64-21.000.

Hasbro Industries, Inc.: *See—*
Eddins, Fred D.; and Tepper, Sidney, 4,249,733, Cl. 273-86.00C.

Haschka, Friedrich; and Berger, Gerhard, to Deutsche Automobilgesellschaft mbH, Firma. Additive for activating iron electrodes in alkaline batteries. 4,250,236, Cl. 429-221.000.

Haselbauer, Gene R.; and Freeman, Bert. Open face spinning reel. 4,249,706, Cl. 242-84.21R.

Hashimoto, Junichiro: *See—*
Tsubuko, Kazuo; Kimura, Taro; Tasaka, Motoo; and Hashimoto, Junichiro, 4,250,241, Cl. 430-114.000.

Hashimoto, Yoshitaka, to Sony Corporation. Undesired signal canceller. 4,250,472, Cl. 333-166.000.

Hassall, Cedric H.: *See—*
Atherton, Frank R.; Hall, Michael J.; Hassall, Cedric H.; Lambert, Robert W.; and Ringrose, Peter S., 4,250,085, Cl. 260-112.50R.

Haswell, Walter T.; and Kasak, August, to Crucible Inc. Powder-metallurgy steel article with high vanadium-carbide content. 4,249,945, Cl. 75-241.000.

Hatanaka, Isamu: *See—*
Kondo, Asaji; Kitajima, Masao; and Hatanaka, Isamu, 4,250,010, Cl. 204-195.00M.

Haug, Edward W.; and Smith, William C., to Barber-Colman Company. Accurate production of relieved shapes by electrical erosion. 4,250,371, Cl. 219-69.00W.

Hauni-Werke Korber & Co. KG: *See—*
Gretz, Heinz; Rudszinat, Willy; and Lorenzen, Heinz-Christen, 4,249,545, Cl. 131-21.00R.
Hinzmann, Alfred, 4,249,547, Cl. 131-94.000.
Reuland, Joachim; Hinze, Herbert; and Reitmeier, Lutz, 4,249,544, Cl. 131-21.00B.

Haupt, Gerhard, to Computer Gesellschaft Konstanz mbH. Device for scanning patterns with a regulated light source. 4,250,488, Cl. 340-146.3AG.

Hausheer, Hans P.: *See—*
Mutzenberg, Arnold B.; and Hausheer, Hans P., 4,250,172, Cl. 428-234.000.

Hauss, Hans J.: *See—*
Weckler, Gerhard; Hauss, Hans J.; Hintermeier, Karl; and Engelhardt, Friedrich, 4,250,296, Cl. 528-295.000.

Hawkins, James B.: *See—*
Van Doorn, Donald W.; Williams, Roy T.; and Hawkins, James B., 4,249,850, Cl. 414-491.000.

Hawley, Richard: *See—*
Roegner, George P.; Hawley, Richard; Steen, Howard; and Biener, Sig, 4,250,537, Cl. 362-86.000.

Hayakawa, Shozaburo: *See—*
Kubota, Shigeo; Kurousu, Asao; and Hayakawa, Shozaburo, 4,250,467, Cl. 331-94.50D.

Hayes, Bobby L.: *See—*
Solbakken, Age; Apffel, Fred P.; Robinson, Sam P.; and Hayes, Bobby L., 4,250,158, Cl. 423-449.000.

Heaton, Frederick, to Hydra-Tight Limited. Bolt tensioning device. 4,249,718, Cl. 254-29.00A.

Heavner, George, to Ortho Pharmaceutical Corporation. Method and composition for preparation of H-SAR-LYS-SAR-GLN-NH_2. 4,250,086, Cl. 260-112.50R.

Heberlein, Joachim V. R.; and Holmes, Francis A., to Electric Power Research Institute, Inc. Electrical circuit breaking device and method. 4,250,363, Cl. 200-144.00B.

Heberlein, Joachim V. R.: *See—*
Kimblin, Clive W.; Holmes, Francis A.; Heberlein, Joachim V. R.; Gorman, Joseph G.; and Slade, Paul G., 4,250,364, Cl. 200-144.00B.

Heckethorn, John E., to Heckethorn Manufacturing Company. U-Bolt clamp. 4,249,759, Cl. 285-382.200.

Heckethorn Manufacturing Company: *See—*
Heckethorn, John E., 4,249,759, Cl. 285-382.200.

Heckle, William A.: *See—*
Burnett, Joseph C., Jr.; and Heckle, William A., 4,250,001, Cl. 204-73.00A.

Hedger, John H. Fluid pressure driven reciprocating engine. 4,249,454, Cl. 91-186.000.

Heger, Werner: *See—*
Gelse, Hans-Dieter; Heger, Werner; and Kramer, Manfred, 4,249,564, Cl. 137-340.000.

Heil, Richard; Gatschmann, Klaus; and Wieshofer, Anton, to Efka-Werke Fritz Kiehn GmbH. Apparatus for filling empty cigarette tubes. 4,249,546, Cl. 131-70.000.

Heimark, Edward L.: *See—*
Connolly, John R.; Gibson, David E.; Heimark, Edward L.; Quinn, Jerome B.; Speechley, Richard E.; and Winter, Richard L., 4,249,863, Cl. 416-185.000.

Heintzman GmbH & Co.: *See—*
Spies, Klaus, 4,249,837, Cl. 405-290.000.

Heiss, Herbert L., to Mobay Chemical Corporation. Process for the preparation of substantially pure cyclo aliphatic diisocyanate stereoisomers. 4,250,106, Cl. 260-453.0SP.

Held, Louis E., Jr., to Container Corporation of America. Composite gas flush can. 4,249,690, Cl. 229-5.500.

Heller, Jorge; and Baker, Richard W., to Alza Corporation. Bioerodible system for delivering drug manufactured from poly(carboxylic acid). 4,249,531, Cl. 128-260.000.

Helm, David P.; and Flogaus, William S., to United States of America, Army. Optical scanning system using folding mirrors and with stabilization. 4,249,791, Cl. 350-16.000.

Helversen, Frederick D. Hydrogen storage apparatus. 4,249,654, Cl. 206-0.700.

Henderson, Henning M.: *See—*
Mostert, Jacob J.; and Henderson, Henning M., 4,250,485, Cl. 340-52.00R.

Henkel Kommanditgesellschaft auf Aktien: *See—*
Asbeck, Adolf; Eckelt, Michael; Erwied, Werner; Heyden, Rudi; and Petzold, Manfred, 4,250,050, Cl. 252-354.000.
Smolka, Heinz G.; and Koppelmann, Edgar, 4,249,903, Cl. 8-137.000.

Hennion, Claude: *See—*
Lewiner, Jacques; and Hennion, Claude, 4,250,415, Cl. 307-400.000.

Henry, David W.: *See—*
Wu, Helen Y.; Smith, Thomas H.; and Henry, David W., 4,250,303, Cl. 536-17.00A.

Herbst, Udo: *See—*
Grundmann, Edgard; Herbst, Udo; and Pommerenke, Horst, 4,249,375, Cl. 60-309.000.

Herchenbach, Horst: *See—*
Brachthauser, Kunibert; Ramesohl, Hubert; and Herchenbach, Horst, 4,249,892, Cl. 432-14.000.

Hercules Incorporated: *See—*
Matlack, Albert S., 4,250,287, Cl. 526-125.000.

Hermann Berstorff Maschinenbau GmbH: *See—*
Anders, Dietmar; and Voigt, Jurgen, 4,249,879, Cl. 425-311.000.

Herrig, Klaus; and Wagner, Heinz, to Acieries Reunies de Burbach-Eich-Dudelage S.A. Arbed. Apparatus for the coiling of wire-mesh webs, especially chain-link fencing, into compact rolls. 4,249,359, Cl. 53-118.000.

Herron, William L.; and Odermann, Charles R., to Singer Company, The. Cam follower with pivotally movable cam engagable shoe. 4,249,428, Cl. 74-569.000.

Hespe, Hans: *See—*
Niederdellmann, Georg; Goyert, Wilhelm; Meisert, Ernst; Eitel, Alfred; Wagner, Hans; and Hespe, Hans, 4,250,292, Cl. 528-44.000.

Hester, Jackson B., Jr., to Upjohn Company, The. 1-(Aminoalkyl) substituted-6-phenyl-4H-s-triazolo[4,3-a][1,4]benzodiazepines. 4,250,094, Cl. 260-245.500.

Hewitt, Burton L. Thread inspection apparatus and method. 4,250,383, Cl. 250-302.000.

Hewlett, Malcolm L., to CX Corporation. Convertible loading and shipping pouch and mounting means for automated photographic customer order sorting device. 4,249,663, Cl. 209-705.000.

Hewlett-Packard Company: *See—*
Bausch, James F.; Brandt, Burkhard A.; and Sanford, Craig A., 4,250,479, Cl. 336-208.000.
Haag, George A.; Fogg, Douglas; Greenley, Gordon A.; Shepard, Steve A.; and Terry, F. Duncan, 4,250,562, Cl. 364-900.000.

Hey, Hansjorg: *See—*
Muller, Werner H.; Mack, Karl E.; and Hey, Hansjorg, 4,250,336, Cl. 568-772.000.

Heyden, Hans-Peter: *See—*
Dethloff, Jurgen; and Heyden, Hans-Peter, 4,250,560, Cl. 364-900.000.

Heyden, Rudi: *See—*
Asbeck, Adolf; Eckelt, Michael; Erwied, Werner; Heyden, Rudi; and Petzold, Manfred, 4,250,050, Cl. 252-354.000.

Heynisch, Hinrich, to Siemens Aktiengesellschaft. Multi-stage collector for transit-time tubes. 4,250,430, Cl. 315-5.380.

Hickey, Robert F.; and Owens, Roger W., to Ecolotrol, Inc. Excess-growth control system for fluidized-bed reactor. 4,250,033, Cl. 210-106.000.

Higgins, William A., to Lubrizol Corporation, The. Corrosion inhibition in well-drilling operations using aqueous systems containing ammonium carboxylates. 4,250,042, Cl. 252-8.50C.

High Performance Composites, Inc.: *See—*
Schmanski, Donald W., 4,249,832, Cl. 404-6.000.

Higuchi, Kanji: *See—*
Nakajima, Koichi; Ishiguro, Tomoji; Okamoto, Tokuhiko; Konaka, Minoru; Nagai, Minoru; Higuchi, Kanji; and Sasaki, Kenji, 4,250,426, Cl. 313-143.000.

Hilbert, Robert S.; Gustafson, Darryl E.; Harris, Thomas I.; and Rimmer, Matthew P., to Magicam, Inc. Composite photography system. 4,249,805, Cl. 352-85.000.

Hill, Richard N., to W. R. Grace & Co. Re-post precipitation control. 4,250,154, Cl. 423-317.000.

Hill, Ruth L.: *See—*
Borror, Alan L.; and Hill, Ruth L., 4,250,244, Cl. 430-217.000.

Hinchcliffe, Dennis, to Molins Limited. Conveyor system for rod-like articles. 4,249,849, Cl. 414-404.000.

Hine, Gordon: *See—*
Mathis, Robert D.; and Hine, Gordon, 4,249,323, Cl. 37-42.00R.

Hinkel, Jerald J., to Dow Chemical Company, The. Breaker system for high viscosity fluids. 4,250,044, Cl. 252-8.55R.

Hintermeier, Karl: *See*—
Weckler, Gerhard; Hauss, Hans J.; Hintermeier, Karl; and Engelhardt, Friedrich, 4,250,296, Cl. 528-295.000.
Hinz, Lorne C.: *See*—
Lougheed, James H.; and Hinz, Lorne C., 4,249,630, Cl. 180-168.000.
Hinze, Herbert: *See*—
Reuland, Joachim; Hinze, Herbert; and Reitmeier, Lutz, 4,249,544, Cl. 131-21.00B.
Hinzmann, Alfred, to Hauni-Werke Korber & Co. KG. Method and apparatus for applying adhesive to running webs of wrapping material. 4,249,547, Cl. 131-94.000.
Hirai, Masahide: *See*—
Uejima, Hiroyuki; Hirai, Masahide; and Kazigase, Masahiro, 4,250,031, Cl. 210-688.000.
Hirao, Kazushige: *See*—
Takahashi, Nobuo; Shimizu, Masamichi; Hirao, Kazushige; and Matsui, Sadayoshi, 4,250,156, Cl. 423-416.000.
Hirota, Takeshi: *See*—
Katabe, Kenichi; Hirota, Takeshi; and Wakasugi, Osamu, 4,250,047, Cl. 252-49.500.
Hitachi, Ltd.: *See*—
Kanamaru, Hisanobu; Tatsumi, Hideo; Okabe, Moisei; and Tohkairin, Akira, 4,249,298, Cl. 29-520.000.
Kanemaru, Kenji; and Iwasaki, Takashiroh, 4,249,809, Cl. 354-23.00D.
Kihara, Toshimasa; and Tsukada, Toshiro, 4,250,493, Cl. 340-347.0NT.
Sento, Hiroshi; Tanabe, Shoji; Shimozu, Tadao; Yamashita, Seiji; and Miyashita, Kunio, 4,250,424, Cl. 310-261.000.
Takenoshita, Mitsuaki; and Shigeta, Masayuki, 4,249,641, Cl. 187-29.00A.
Yamakido, Kazuo; and Tsukamoto, Nobuo, 4,250,492, Cl. 340-347.0DA.
Hochstetler, Alan R.; Fredericks, Glen R.; and Golle, Erlinda F., to Givaudan Corporation. 2-Acetyl-1,3,3,4,4-pentamethylcyclopentene as a fragrance material. 4,250,061, Cl. 252-522.00R.
Hodge, Walter D.: *See*—
Christie, Howard W.; and Hodge, Walter D., 4,249,477, Cl. 118-/413.000.
Hoechst Aktiengesellschaft: *See*—
Dursch, Walter; Linke, Fritz; and Kleiner, Hans-Jerg, 4,250,124, Cl. 260-928.000.
Faust, Raimund J., 4,250,248, Cl. 430-284.000.
Lask, Helmut; Holst, Arno; Nischwitz, Ehrenfried; and Sommer, Hans, 4,250,306, Cl. 536-88.000.
Muller, Werner H.; Mack, Karl E.; and Hey, Hansjorg, 4,250,336, Cl. 568-772.000.
Sander, Jurgen; Buhr, Gerhard; and Ruckert, Hans, 4,250,247, Cl. 430-270.000.
Hoefke, Wolfgang: *See*—
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Hoefke, Wolfgang; Gaida, Wolfram; and Pichler, Ludwig, 4,250,186, Cl. 424-273.00R.
Hoekstra, Philip M.: *See*—
Buckman, Robert H.; Hoekstra, Philip M.; and Pera, John D., 4,250,269, Cl. 525-6.000.
Hoelzer, E. Clyde; and Magnuson, Ellis. Dental console. 4,249,900, Cl. 433-79.000.
Hoff, Edwin F., Jr.: *See*—
Click, Gaylon T.; Turner, Nathan L.; and Hoff, Edwin F., Jr., 4,250,083, Cl. 260-45.9QB.
Hoff, Marcian E., Jr.: *See*—
Tsang, Frederick; Kannal, Gregory A.; and Hoff, Marcian E., Jr., 4,250,570, Cl. 365-200.000.
Hoffert, Franklin D.: *See*—
Denker, Bernard L.; and Hoffert, Franklin D., 4,249,911, Cl. 44-53.000.
Hoffmann-La Roche Inc.: *See*—
Atherton, Frank R.; Hall, Michael J.; Hassall, Cedric H.; Lambert, Robert W.; and Ringrose, Peter S., 4,250,085, Cl. 260-112.50R.
Li, Choh H., 4,250,087, Cl. 260-112.50R.
Poncioni, Bruno, 4,250,315, Cl. 346-198.000.
Walser, Armin, 4,250,095, Cl. 260-245.600.
Hoffmann, Werner: *See*—
Baumann, Manfred; and Hoffmann, Werner, 4,250,101, Cl. 260-348.570.
Hofmann, Judson A., to Zenith Radio Corporation. Full wave rectifier envelope detector. 4,250,457, Cl. 329-101.000.
Hohmann, Eugen, to Siemens Aktiengesellschaft. Control installation for a dental apparatus. 4,250,439, Cl. 318-601.000.
Hokele, Gunther: *See*—
Scharf, Helmut; Franz, Gerhard; and Hokele, Gunther, 4,250,119, Cl. 568-389.000.
Hokkaido University, President of: *See*—
Koyama, Tomiyasu; Horimoto, Masashi; and Horimoto, Midori, 4,249,540, Cl. 128-666.000.
Holland Company: *See*—
Murphy, Richard F., 4,249,664, Cl. 213-61.000.
Hollick, John G., to USM Corporation. Machine for stiffening and forming sheet material. 4,249,320, Cl. 36-68.000.
Holmes, Francis A.: *See*—
Heberlein, Joachim V. R.; and Holmes, Francis A., 4,250,363, Cl. 200-144.00B.
Kimblin, Clive W.; Holmes, Francis A.; Heberlein, Joachim V. R.; Gorman, Joseph G.; and Slade, Paul G., 4,250,364, Cl. 200-144.00B.
Holst, Arno: *See*—
Lask, Helmut; Holst, Arno; Nischwitz, Ehrenfried; and Sommer, Hans, 4,250,306, Cl. 536-88.000.
Holt, Rush D. Method for maintaining a correct density gradient in a non-convecting solar pond. 4,249,518, Cl. 126-415.000.
Holtermann, Hugo: *See*—
Nordal, Vegard; and Holtermann, Hugo, 4,250,113, Cl. 564-153.000.
Holtz, Hans D., deceased (by Holtz, Marilyn T., executrix); and Bonazza, Benedict R., to Phillips Petroleum Company. Aminoamide fuel detergents. 4,249,912, Cl. 44-71.000.
Holtz, Marilyn T., executrix: *See*—
Holtz, Hans D., deceased; and Bonazza, Benedict R., 4,249,912, Cl. 44-71.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Nishimura, Hiroyuki, 4,249,505, Cl. 123-587.000.
Noguchi, Takeshi; Nishimura, Hiroyuki; and Umemoto, Takashi, 4,249,503, Cl. 123-568.000.
Shioya, Toshio; Ishii, Kiyoshi; and Nishimura, Hiroyuki, 4,249,490, Cl. 123-568.000.
Shioya, Toshio; Ishii, Kiyoshi; and Nishimura, Hiroyuki, 4,249,504, Cl. 123-568.000.
Honeywell Inc.: *See*—
Chapman, James; and Ratz, James W., 4,250,441, Cl. 318-626.000.
Joseph, James D.; and Wilwerding, Dennis J., 4,250,376, Cl. 250-204.000.
Wade, Gerald J., 4,250,266, Cl. 435-289.000.
Wilwerding, Dennis J., 4,250,377, Cl. 250-204.000.
Honeywell Information Systems Inc.: *See*—
Kindell, Jerry L., 4,250,548, Cl. 364-200.000.
Honig, Gunter; and Moller, Heinz, to Robert Bosch GmbH. Method and system for generating operation-dependent control signals for apparatus, particularly ignition and fuel injections systems for internal combustion engines. 4,249,493, Cl. 123-416.000.
Hood, Grant W., Jr.: *See*—
Grab, George P.; Hood, Grant W., Jr.; Swanson, Sigurd A.; and Nemeth, Bela J., 4,249,955, Cl. 106-308.00Q.
Hooker Chemicals & Plastics Corp.: *See*—
Lazarz, Christine A.; Cook, Edward H., Jr.; and Schulz, Arthur C., 4,250,002, Cl. 204-98.000.
Lin, Henry C.; and Robota, Stephen, 4,250,122, Cl. 570-209.000.
Hopson, Walter G., III. Gun scope mount system. 4,249,315, Cl. 33-250.000.
Horbelt, Michael: *See*—
Drews, Ulrich; Schnurle, Hans; and Horbelt, Michael, 4,249,498, Cl. 123-478.000.
Horimoto, Masashi: *See*—
Koyama, Tomiyasu; Horimoto, Masashi; and Horimoto, Midori, 4,249,540, Cl. 128-666.000.
Horimoto, Midori: *See*—
Koyama, Tomiyasu; Horimoto, Masashi; and Horimoto, Midori, 4,249,540, Cl. 128-666.000.
Hornby, Leonard, to Howorth Air Engineering Limited. Workstation. 4,249,463, Cl. 98-115.0LH.
Hosoi, Kaoru; Ikeda, Tadamasa; Nakayoshi, Takemi; and Okada, Akira, to Meiji Seika Kaisha Ltd. Method of producing antibiotics suppositories. 4,250,169, Cl. 424-181.000.
Hotta, Masashi, to Shimano Industrial Company, Limited. Constant temperature box. 4,249,392, Cl. 62-457.000.
Hou, Ching-Tsang; Patel, Ramesh N.; and Laskin, Allen I., to Exxon Research & Engineering Co. Microbiological production of ketones from C_3-C_6 secondary alcohols. 4,250,259, Cl. 435-148.000.
Hounsfield, Godfrey N.; Waltham, Richard M.; Pisano, Daniel J., Jr.; and Olson, Erlvada A., to EMI Limited. Medical radiographic apparatus and method. 4,250,387, Cl. 250-445.00T.
Hover, David J. Method and apparatus for generating and delivering gaseous fuel vapor to an internal combustion engine. 4,249,502, Cl. 123-557.000.
Howard, Thomas J., Jr.: *See*—
Secoura, Ralph J.; and Howard, Thomas J., Jr., 4,249,310, Cl. 30-276.000.
Howell, Phillip C. Method and apparatus for handling flux fines. 4,249,906, Cl. 23-313.00R.
Howorth Air Engineering Limited: *See*—
Hornby, Leonard, 4,249,463, Cl. 98-115.0LH.
Hubbard, Arthur L.; Copley, Russell D.; and Nieman, Merle D., to Deere & Company. Cotton harvester. 4,249,365, Cl. 56-13.200.
Hubert, Guy; and Dechenne, Roger, to Solvay & Cie. Hollow body of thermoplastic material. 4,249,666, Cl. 215-1.00C.
Hudson, Gordon F., to Grumman Aerospace Corporation. Manufacture of honeycomb sandwich. 4,249,976, Cl. 156-286.000.
Huebner, Steven R.: *See*—
Mayers, Richard R.; Huebner, Steven R.; and Chojnacki, Dennis A., 4,249,893, Cl. 432-49.000.
Huegli, Ronald W. Package for sprouts. 4,249,341, Cl. 47-14.000.
Hug, Charles R., to United States of America, Navy. Quick disconnect cap having pressure venting means. 4,249,670, Cl. 220-295.000.
Hughes Aircraft Company: *See*—
DuPont, Preston S.; and Rogers, Howard H., 4,250,235, Cl. 429-211.000.
Joseph, Thomas R., 4,250,474, Cl. 333-196.000.
Kimura, Hiroshi, 4,249,987, Cl. 156-603.000.
Stephens, Craig P.; and Rill, James C., 4,249,299, Cl. 29-578.000.

Hughes, Richard S.: *See*—
Jernigan, James L.; and Hughes, Richard S., 4,250,466, Cl. 331-94.50M.
Hugl, Herbert; Wolfrum, Gerhard; Reel, Henning; Kunnel, Werner; Kuth, Robert; and Gohrbandt, Wilhelm, to Bayer Aktiengesellschaft. Process for dyeing and printing cellulose fibres. 4,249,275, Cl. 8-532.000.
Hugo, Kern & Liebers & Company: *See*—
Otzen, Uwe; and Gruner, Peter, 4,249,709, Cl. 242-107.300.
Huhtala, Olavi A.: *See*—
Bolton, Joseph A.; and Huhtala, Olavi A., 4,249,399, Cl. 68-20.000.
Hull, John R.; and Iles, Malvern K., to Iowa State University Research Foundation, Inc. Frustrated total internal reflection camera shutter. 4,249,814, Cl. 354-154.000.
Hundstad, Richard L.; and Farish, Owen, to Westinghouse Electric Corp. Technique for CW or quasi CW operation of planar electrode laser apparatus. 4,250,468, Cl. 331-94.5PE.
Huneke, Walter, to Deere & Company. Axle for motor vehicles. 4,249,631, Cl. 180-255.000.
Hunt, Keith R., to Britax Weathershields Limited. Vehicle opening roofs. 4,249,770, Cl. 296-218.000.
Hunt, Paulmer D.: *See*—
Riggs, Robert R.; and Hunt, Paulmer D., 4,249,453, Cl. 91-59.000.
Hurst, John, to W. R. Grace & Co. Ltd. Method of making flexible cementitious materials. 4,249,950, Cl. 106-90.000.
Hurt, James M., Jr.: *See*—
Dick, David C.; and Hurt, James M., Jr., 4,249,916, Cl. 55-73.000.
Huta Stalowa Wola-Kombinat Przemyslowy: *See*—
Bambuch, Tadeusz; Wilusz, Henryk; Englert, Wieslaw; Czank, Stanislaw; and Surmiak, Stanislaw, 4,249,964, Cl. 148-16.500.
Hutt, Arthur R. Articulated vehicle. 4,249,629, Cl. 180-134.000.
Huwelmann, Helmut: *See*—
Tetenborg, Konrad; and Huwelmann, Helmut, 4,249,361, Cl. 53-415.000.
Hyatt, David E.: *See*—
Ruskin, Richard P.; Zafar, Humayon Z.; Goens, Duane N.; Hyatt, David E.; and Kenney, Charlie W., 4,250,157, Cl. 423-417.000.
Hydes, Paul D.; and Watkins, David M., to Johnson, Matthey & Co., Limited. Compositions containing platinum. 4,250,189, Cl. 424-287.000.
Hydra-Tight Limited: *See*—
Heaton, Frederick, 4,249,718, Cl. 254-29.00A.
Hydraflow Supply, Inc.: *See*—
Mahoff, George A., 4,249,786, Cl. 339-15.000.
Hydril Company: *See*—
Krause, William F., 4,249,599, Cl. 166-72.000.
Hydrocarbon Research, Inc.: *See*—
Comolli, Alfred G., 4,249,909, Cl. 44-1.00G.
Denker, Bernard L.; and Hoffert, Franklin D., 4,249,911, Cl. 44-53.000.
Ichida, Toshio; Komatsubara, Michiro; and Shimanaka, Hiroshi, to Kawasaki Steel Corporation. Method of forming a forsterite insulating film on the surface of a grain-oriented silicon steel sheet. 4,249,966, Cl. 148-113.000.
Ichikawa Iron Works Company Limited: *See*—
Ichikawa, Michihiro, 4,249,784, Cl. 308-202.000.
Ichikawa, Michihiro, to Ichikawa Iron Works Company Limited. Bearing assembly. 4,249,784, Cl. 308-202.000.
ICI Americas Inc.: *See*—
Hartnett, Deborah I., 4,250,202, Cl. 426-553.000.
Igarashi, Katsutoshi: *See*—
Kotani, Teizo; Matsumoto, Shuichi; Igarashi, Katsutoshi; and Suzuki, Kazuo, 4,250,063, Cl. 260-4.00R.
Igarashi, Toru: *See*—
Yoshiike, Katsushi; Igarashi, Toru; and Yamaryo, Yasuyuki, 4,250,381, Cl. 250-237.00G.
Iglesias, Jose J., to Iglesias Trust, The, Elania Iglesias, Trustee. Connector for optical devices. 4,249,799, Cl. 350-257.000.
Iglesias Trust, The: *See*—
Iglesias, Jose J., 4,249,799, Cl. 350-257.000.
Ihara Chemical Industry Co., Ltd.: *See*—
Takahashi, Nobuo; Shimizu, Masamichi; Hirao, Kazushige; and Matsui, Sadayoshi, 4,250,156, Cl. 423-416.000.
Iizuka, Haruhiko: *See*—
Sugasawa, Fukashi; Iizuka, Haruhiko; Matsumoto, Junichiro; and Etoh, Yukihiro, 4,249,374, Cl. 60-276.000.
Ikeda, Tadamasa: *See*—
Hosoi, Kaoru; Ikeda, Tadamasa; Nakayoshi, Takemi; and Okada, Akira, 4,250,169, Cl. 424-181.000.
Ikura, Hiroshi: *See*—
Nagai, Tsuneji; Machida, Yoshiharu; Suzuki, Yoshiki; and Ikura, Hiroshi, 4,250,163, Cl. 424-14.000.
Iles, Malvern K.: *See*—
Hull, John R.; and Iles, Malvern K., 4,249,814, Cl. 354-154.000.
Illinois Tool Works Inc.: *See*—
Hammer, Victor S., Jr.; and Swick, E. Grant, 4,250,356, Cl. 179-146.00R.
Imai, Tamotsu, to UOP Inc. Preparation of tertiary amines. 4,250,115, Cl. 564-436.000.
Imbert, Thierry F.: *See*—
Bucher, Bernard P.; Ancher, Jean-Francois R.; and Imbert, Thierry F., 4,250,178, Cl. 424-251.000.
Imperial Chemical Industries Limited: *See*—
Caunt, Anthony D.; and Jaggard, James F. R., 4,250,283, Cl. 526-77.000.
Wooler, Alan M.; and Bengtson, Olle, 4,249,949, Cl. 106-90.000.
In Situ Technology, Inc.: *See*—
Terry, Ruel C., 4,250,230, Cl. 429-12.000.
Inaga, Hisashi, to Kioritz Corporation. Grass cutting apparatus. 4,249,311, Cl. 30-276.000.
Ingersoll, Clyde E.: *See*—
Mohammed, M. Hamdi A.; Agarwal, Dwarika P.; and Ingersoll, Clyde E., 4,249,943, Cl. 75-171.000.
Ingles Hovercraft Associates Limited: *See*—
Longley, Timothy J. R., 4,249,628, Cl. 180-117.000.
Inmont Corporation: *See*—
Schefbauer, Rupert J., 4,250,066, Cl. 260-25.000.
Inoue, Eiichi: *See*—
Miyakawa, Nobuhiro; Kokado, Hiroshi; and Inoue, Eiichi, 4,250,250, Cl. 430-374.000.
Institut Francais du Petrole: *See*—
Mimoun, Hubert, 4,250,121, Cl. 568-431.000.
Institut National de Recherche Chimique Appliquee: *See*—
Mavel, Gerard F. G.; Morel, Emile M. J.; and Richert, Gabriel M., 4,250,222, Cl. 428-285.000.
Intel Corporation: *See*—
Tsang, Frederick; Kannal, Gregory A.; and Hoff, Marcian E., Jr., 4,250,570, Cl. 365-200.000.
Intenco, Inc.: *See*—
Solbakken, Age; Apffel, Fred P.; Robinson, Sam P.; and Hayes, Bobby L., 4,250,158, Cl. 423-449.000.
International Business Machines Corporation: *See*—
Briska, Marian; and Thiel, Klaus P., 4,249,970, Cl. 148-188.000.
Cuomo, Jerome J.; Gambino, Richard J.; Harper, James M.; and Kupstis, John D., 4,250,009, Cl. 204-192.00N.
Gardiner, James R.; Pliskin, William A.; Revitz, Martin; and Shepard, Joseph F., 4,249,968, Cl. 148-174.000.
Kleczkowski, Stawomir P.; and Ross, Rupert F., 4,250,529, Cl. 360-98.000.
Sincerbox, Glenn T.; and Gordon, Joseph G., II, 4,249,796, Cl. 350-370.000.
International Flavors & Fragrances Inc.: *See*—
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,250,194, Cl. 426-3.000.
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Vinals, Joaquin F.; Kiwala, Jacob; and Schmitt, Frederick L., 4,250,201, Cl. 426-538.000.
Sprecker, Mark A.; Sanders, James M.; Schreiber, William L.; Watkins, Hugh; Vinals, Joaquin F.; Shuster, Edward J.; O'Rourke, Thomas J.; Hagedorn, Myrna L.; and Klemarczyk, Philip, 4,250,338, Cl. 568-343.000.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,250,342, Cl. 568-826.000.
Trenkle, Robert W.; Mookherjee, Braja D.; Hall, John B.; Kasper, Robin; Vock, Manfred H.; Schreck, Ronald; Granda, Edward J.; and Vinals, Joaquin F., 4,250,332, Cl. 568-347.000.
Wiegers, Wilhelmus J.; Sprecker, Mark A.; Watkins, Hugh; Vock, Manfred H.; and Schmitt, Frederick L., 4,250,200, Cl. 426-536.000.
Wilson, Richard A.; Schreiber, William L.; Mookherjee, Braja D.; Kiwala, Jacob; Vinals, Joaquin F.; Vock, Manfred H.; Stork, Gilbert; and Schmitt, Frederick L., 4,250,049, Cl. 252-174.110.
International Nickel Co., Inc., The: *See*—
Crosby, Jeffrey N.; and Hanley, Robert S., 4,250,210, Cl. 427-252.000.
Sandrock, Gary D.; and Keresztes, Stephan L., 4,249,940, Cl. 75-122.000.
International Paper Company: *See*—
Gray, Geoffrey I.; and Freeborn, John O., 4,250,397, Cl. 219-345.000.
International Standard Electric Corporation: *See*—
Maries, Alan; and Shreeve, Francesca M., 4,250,277, Cl. 525-337.000.
International Telephone and Telegraph Corporation: *See*—
Liu, Yet-Zen; and Chiang, Shang-Yi, 4,249,967, Cl. 148-171.000.
Sakamoto, Norman Y., 4,250,454, Cl. 328-155.000.
Iowa State University Research Foundation, Inc.: *See*—
Hull, John R.; and Iles, Malvern K., 4,249,814, Cl. 354-154.000.
Ippolitov, Jury S.: *See*—
Korenev, Vladimir P.; Ippolitov, Jury S.; Belyaev, Boris P.; Kalninsh, Arvid Y.; Vedernikov, Nikolai A.; Krastinsh, Valter P.; Abolinsh, Guntis K.; Abele, Karl M.; and Ekis, Felix A., 4,249,703, Cl. 241-247.000.
Ishiguro, Tomoji: *See*—
Nakajima, Koichi; Ishiguro, Tomoji; Okamoto, Tokuhiko; Konaka, Minoru; Nagai, Minoru; Higuchi, Kanji; and Sasaki, Kenji, 4,250,426, Cl. 313-143.000.
Ishii, Kiyoshi: *See*—
Shioya, Toshio; Ishii, Kiyoshi; and Nishimura, Hiroyuki, 4,249,490, Cl. 123-568.000.
Shioya, Toshio; Ishii, Kiyoshi; and Nishimura, Hiroyuki, 4,249,504, Cl. 123-568.000.
Ishii, Takashi: *See*—
Katoh, Masayoshi; Ishii, Takashi; and Nagaoka, Tadahiko, 4,249,673, Cl. 222-3.000.
Ishii, Yoshio: *See*—
Fukuzaki, Fukushichi; Ishii, Yoshio; and Fukuzawa, Masaki, 4,249,927, Cl. 65-75.000.

Ishikawa, Hisao: *See*—
Iwataki, Isao; Shibuya, Masami; Ishikawa, Hisao; and Kawana, Takashi. 4,249,937, Cl. 71-97.000.
Ito, Katsuo; Murata, Bunjiro; and Yoshimura, Kazunori, to Murata Manufacturing Co., Ltd. Coaxial cable connector plug. 4,249,790, Cl. 339-177.00E.
Ito, Tadashi: *See*—
Suzuki, Masayuki; Ito, Tadashi; Yamamichi, Masayoshi; and Murakami, Hiroyasu. 4,249,816, Cl. 354-266.000.
Ito, Yukiyoshi: *See*—
Fujita, Kiyoshi; Ito, Yukiyoshi; and Kamimori, Shigeru. 4,250,328, Cl. 560-205.000.
Itoh, Isamu; and Yoshida, Yoshinobu, to Fuji Photo Film Co., Ltd. Photographic light-sensitive sheet for the color diffusion transfer process. 4,250,246, Cl. 430-223.000.
Itoh, Katsumi: *See*—
Iwaki, Katsutaro; Mori, Kazumasa; Mase, Akira; Nimura, Takayasu; Itoh, Katsumi; Akita, Yoshio; Muto, Katsuya; Asahi, Taro; and Banzai, Keiichiro. 4,250,444, Cl. 322-28.000.
Itoh, Michiro: *See*—
Uchikuga, Saburo; Itoh, Michiro; and Nagahama, Katsuyasu. 4,250,109, Cl. 564-104.000.
Ivanov, Jury S.: *See*—
Mikhailov, Viktor V.; Karakovsky, Alexandr K.; Dyachenko, Petr Y.; Ivanov, Jury S.; Mikhailov, Igor V.; Lunin, Mikhail G.; Buyanov, Alexei V.; Konstantinov, Alexei A.; Shagurin, Anatoly S.; Kirillov, Alexandr P.; Mikhailov, Oleg V.; and Khaimov, Arkady S., 4,249,871, Cl. 425-111.000.
Ivanyatov, Jury E.: *See*—
Kolosov, Ivan A.; Kuryshev, Nikolai V.; Ivanyatov, Jury E.; Kalininskaya, Vera N.; Yartsev, Igor K.; Pugachev, Arkady K.; and Savina, Svetlana M., 4,250,204, Cl. 427-58.000.
Iwai, Takashi: *See*—
Sasaki, Nobuo; Nakano, Moto'o; Kobayashi, Yasuo; and Iwai, Takashi, 4,250,569, Cl. 365-185.000.
Iwaki, Katsutaro; Mori, Kazumasa; Mase, Akira; Nimura, Takayasu; Itoh, Katsumi; Akita, Yoshio; Muto, Katsuya; Asahi, Taro; and Banzai, Keiichiro, to Nippondenso Co., Ltd. Voltage regulator system for vehicle generator. 4,250,444, Cl. 322-28.000.
Iwasaki, Takashiroh: *See*—
Kanemaru, Kenji; and Iwasaki, Takashiroh, 4,249,809, Cl. 354-23.00D.
Iwase, Masaaki: *See*—
Saegusa, Takeo; Yamada, Akira; Iwase, Masaaki; and Iwatani, Akitoshi, 4,250,300, Cl. 528-401.000.
Iwata, Shozo. Apparatus for treating fabric by beating while fabric is in the spread or flattened state. 4,249,288, Cl. 26-22.000.
Iwataki, Isao; Shibuya, Masami; Ishikawa, Hisao; and Kawana, Takashi, to Nippon Soda Company, Ltd. Cyclohexane derivatives. 4,249,937, Cl. 71-97.000.
Iwatani, Akitoshi: *See*—
Saegusa, Takeo; Yamada, Akira; Iwase, Masaaki; and Iwatani, Akitoshi, 4,250,300, Cl. 528-401.000.
Iwer, Herbert W.; and Cochran, Johnnie J., to Motorola, Inc. Common base connected transistor and bias network. 4,250,462, Cl. 330-296.000.
Iyeta, Motoi, to Nippon Gakki Seizo Kabushiki Kaisha. Rotation angle detector. 4,250,380, Cl. 250-231.0SE.
JAB Company, Incorporated: *See*—
Gdovichin, George G., 4,250,359, Cl. 200-80.00R.
Jackson, Charles A.; and Ecklund, Ray A. Work table or portable scaffold. 4,249,636, Cl. 182-152.000.
Jacobs, Joseph M., to Zenith Radio Corporation. Method and apparatus for forming electrical leads for retention in printed circuit boards. 4,249,582, Cl. 140-105.000.
Jacquemin, Werner: *See*—
Kaufhold, Manfred; and Jacquemin, Werner, 4,250,343, Cl. 568-903.000.
Jaeger, Hermann-Siegfried: *See*—
Oppl, Othmar; and Jaeger, Hermann-Siegfried, 4,249,881, Cl. 425-543.000.
Jagenberg-Werke AG: *See*—
Klapp, Hartmut, 4,249,360, Cl. 53-244.000.
Jagers, Leopold, to Trennjaeger Maschinenfabrik. Machine for sawing elongated work pieces. 4,249,443, Cl. 83-490.000.
Jaggard, James F. R.: *See*—
Caunt, Anthony D.; and Jaggard, James F. R., 4,250,283, Cl. 526-77.000.
Jakowicki, Henry. Tile construction for a swimming pool. 4,249,273, Cl. 4-494.000.
James, Peter G.: *See*—
Foster, Alan I.; James, Peter G.; McCarroll, John J.; and Tennison, Stephen R., 4,250,057, Cl. 252-447.000.
Janssen, Alexander P. Visible indexes. 4,250,216, Cl. 428-78.000.
Janssen, Hans-Georg, to Aktiengesellschaft "Weser" Werft Bremen. Arrangement for holding ropes and the like. 4,249,765, Cl. 294-84.000.
Janssen Pharmaceutica N.V.: *See*—
Vandenberk, Jan; Kennis, Ludo E. J.; Van der Aa, Marcel J. M. C.; and Van Heertum, Albert H. M. T., 4,250,176, Cl. 424-250.000.
Janu, Maria M., to General Electric Company. Device for interfacing an x-ray image intensifier and spot film device. 4,250,388, Cl. 250-468.000.
Japan Synthetic Rubber Co., Ltd.: *See*—
Kotani, Teizo; Matsumoto, Shuichi; Igarashi, Katsutoshi; and Suzuki, Kazuo, 4,250,063, Cl. 260-4.00R.
Jaquay, Louis H., to Dravo Corporation. Apparatus for the flash oxidation of metal concentrates. 4,249,722, Cl. 266-172.000.
Jeanneret, Rene, to Leclanche S.A. Tubular plates for lead storage batteries. 4,250,233, Cl. 429-140.000.
Jebens, Robert W., to RCA Corporation. Solar cell construction. 4,249,959, Cl. 136-244.000.
Jefferson, Donald E.: *See*—
Beitchman, Burton D.; Jefferson, Donald E.; and Seymour, John P., 4,250,293, Cl. 528-93.000.
Jelend, Wolfgang: *See*—
Karwat, Heinz; Lang, Roland; and Jelend, Wolfgang, 4,250,150, Cl. 423-226.000.
Jelinek, Nikolaus: *See*—
Boser, Heinz; and Jelinek, Nikolaus, 4,249,819, Cl. 354-312.000.
Jensen, William C., to Western Farm Services Inc. Reactor for preparation of ammonium polyphosphate. 4,250,147, Cl. 422-189.000.
Jerman, Rafael. Combination sun visor and hair pick. 4,249,548, Cl. 132-9.000.
Jernigan, James L.; and Hughes, Richard S., to United States of America, Navy. Multiple pulse laser. 4,250,466, Cl. 331-94.50M.
Jessup, Gregory M.: *See*—
Anderson, Bruce W.; Jessup, Gregory M.; and Preniczny, Robert B., 4,249,642, Cl. 188-73.200.
Jikihara, Tetsuo: *See*—
Wakabayashi, Osamu; Matsuya, Kuni; Ohta, Hiroki; Jikihara, Tetsuo; and Suzuki, Seiichi, 4,249,934, Cl. 71-92.000.
Jogand, Patrick, to Commissariat a l'Energie Atomique. Liquid-metal cooled reactor with practically static intermediate zone. 4,249,995, Cl. 176-65.000.
Johns-Manville Corporation: *See*—
Sturtz, John V., 4,249,441, Cl. 83-347.000.
Johnson, Gerard F.; and Schilke, Peter W., to United Technologies Corporation. Alumina coated silicon carbide abrasive. 4,249,913, Cl. 51-295.000.
Johnson, Herbert S., to Gulf Canada Limited. Recovery of sulfur from gas streams containing sulfur and sulfur compounds in dilute concentration. 4,250,151, Cl. 423-230.000.
Johnson, Howard L. Self loading multiple bale trailer. 4,249,842, Cl. 414-24.500.
Johnson & Johnson: *See*—
Chase, Richard A.; Williams, D. Michael; and Simpson, Danny E., 4,249,333, Cl. 46-1.00R.
Millet, Marcus J., 4,249,530, Cl. 128-218.00N.
Johnson, Lee E.: *See*—
Anderson, Earl R.; and Johnson, Lee E., 4,249,355, Cl. 52-593.000.
Johnson, Leslie H.: *See*—
Cosimini, Gregory J.; Johnson, Leslie H.; Lo, David S.; Nelson, George F.; and Paul, Maynard C., 4,250,565, Cl. 365-87.000.
Johnson, Matthey & Co., Limited: *See*—
Hydes, Paul D.; and Watkins, David M., 4,250,189, Cl. 424-287.000.
Johnson, Paulette: *See*—
Martin, Jerry R.; Tadanier, John S.; Johnson, Paulette; and Nadzan, Alex M., 4,250,304, Cl. 536-17.00R.
Johnson, Roger W.: *See*—
Evans, Duane E.; Brown, William L., Jr.; and Johnson, Roger W., 4,249,382, Cl. 60-605.000.
Johnston, Linda G.: *See*—
Baigrie, Brian D.; Bailey, Joseph; Johnston, Linda G.; and Mijovic, Miroslav V., 4,250,238, Cl. 430-17.000.
Johnston, Robert J.; Layciak, Stephen G.; and Dobrosielski, Stephen S., to Westinghouse Electric Corp. Detachable switch structure. 4,250,368, Cl. 200-307.000.
Jones, Andrew R., to Westinghouse Electric Corp. Tracking solar energy concentrator. 4,249,514, Cl. 126-438.000.
Jones, Cyril W. Leader dispenser. 4,249,707, Cl. 242-85.100.
Jones, Ira D. Scope for viewing the internal surface of a bore or similar cavity. 4,249,795, Cl. 350-96.260.
Jones, Kenneth L., to Procter & Gamble Company, The. Detergent-compatible antistatic compositions. 4,250,043, Cl. 252-8.600.
Jones, Marshall G.: *See*—
Viertl, John R. M.; and Jones, Marshall G., 4,249,423, Cl. 73-783.000.
Jones, William M. Air conditioning system. 4,249,390, Cl. 62-238.00E.
Josam Lastbilteknik AB: *See*—
Samuelsson, Mokjas J., 4,249,409, Cl. 72-305.000.
Joseph, James D.; and Wilwerding, Dennis J., to Honeywell Inc. Apparatus for range finding equipment. 4,250,376, Cl. 250-204.000.
Joseph, Thomas R., to Hughes Aircraft Company. Continuous beam steering acoustic wave transducer. 4,250,474, Cl. 333-196.000.
K. P. Graham & Associates Pty. Ltd.: *See*—
Graham, Kenneth P., 4,249,890, Cl. 432-13.000.
K. R. Komarek, Inc.: *See*—
Komarek, Karl R., 4,249,878, Cl. 425-237.000.
Kabushiki Kaisha Meidensha: *See*—
Tsuzuki, Kanemitsu; Motobayashi, Kozo; Watanabe, Kazuo; Kito, Yastami; and Seko, Shigeo, 4,249,369, Cl. 57-263.000.
Kabushiki Kaisha Ohara Kogaku Garasu Seizosho: *See*—
Fukuzaki, Fukushichi; Ishii, Yoshio; and Fukuzawa, Masaki, 4,249,927, Cl. 65-75.000.
Kabushiki Kaisha Suwa Seikosha: *See*—
Murata, Masami, 4,250,523, Cl. 368-82.000.
Saito, Toshiaki, 4,250,573, Cl. 368-73.000.
Kabushiki Kaisha Toyoda Jidoh Shokki Seisakusho: *See*—
Tsuzuki, Kanemitsu; Motobayashi, Kozo; Watanabe, Kazuo; Kito, Yastami; and Seko, Shigeo, 4,249,369, Cl. 57-263.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Arai, Tohru, 4,250,208, Cl. 427-249.000.
Kabushiki Kaisha Toyota Chuo Kenkyusho and Nippondenso Co., Ltd.: *See*—
Nakajima, Koichi; Ishiguro, Tomoji; Okamoto, Tokuhiko; Konaka, Minoru; Nagai, Minoru; Higuchi, Kanji; and Sasaki, Kenji, 4,250,426, Cl. 313-143.000.
Kaiser, Roman, to Givaudan Corporation. 1,4-Epoxy-1,3,3-trimethyl-2-(2-buten-1-ylidene) cyclohexanes as odorants. 4,250,062, Cl. 252-522.00R.
Kaiser, Roman, to Givaudan Corporation. Megastigma-5(11)8-dien-4,7-oxides and tetra-substituted-7-oxa-bicyclo[3.3.0]-octanes. 4,250,099, Cl. 260-346.220.
Kajfez, Franjo, to CRC Compagnia di Ricerca Chimica S.A. Derivatives of N-cyano-azomethines and process for their preparation. 4,250,092, Cl. 260-239.00E.
Kaktovics, David: *See*—
Ashcroft, Richard I.; Kaktovics, David; Monson, Anthony E. P.; and Weeks, David M., 4,250,405, Cl. 235-456.000.
Kalfoglou, George, to Texaco Inc. Lignosulfonates carboxylated with carbon dioxide as additives in oil recovery processes involving chemical recovery agents. 4,249,606, Cl. 166-273.000.
Kalininskaya, Vera N.: *See*—
Kolosov, Ivan A.; Kuryshev, Nikolai V.; Ivanyatov, Jury E.; Kalininskaya, Vera N.; Yartsev, Igor K.; Pugachev, Arkady K.; and Savina, Svetlana M., 4,250,204, Cl. 427-58.000.
Kallaes, Elis; and Starell, Karl-Erik, to Orsa Kattingfabrik AB. Lashing rod. 4,249,840, Cl. 410-81.000.
Kalmykov, Vladimir N.; Musiiko, Vitaly A.; Khlopkov, Leonid P.; Gashenko, Stanislav I.; Rogatkin, Alexandr A.; Silakov, Grigory I.; Shipilov, Viktor F., deceased; by Skibina, Elena S., administrator; by Shipilov, Gennady V., administrator; and by Shipilov, Fedor D., administrator. Isolating solid substances from a vapor and gas mixture and pulps. 4,249,989, Cl. 159-10.000.
Kalninsh, Arvid Y.: *See*—
Korenev, Vladimir P.; Ippolitov, Jury S.; Belyaev, Boris P.; Kalninsh, Arvid Y.; Vedernikov, Nikolai A.; Krastinsh, Valter P.; Abolinsh, Guntis K.; Abele, Karl M.; and Ekis, Felix A., 4,249,703, Cl. 241-247.000.
Kalt, Charles G. Matrix type electrostatic precipitator. 4,249,919, Cl. 55-130.000.
Kaluzhsky, Nikolai A.; Gefter, Semen E.; Tsybukov, Igor K.; Evdokimov, Svetozar V.; Derkach, Alexei S.; Tsyplakov, Anatoly M.; Lankin, Valery P.; Velichko, Boris P.; Kostin, Albert A.; Volfson, Grigory E.; and Nikiforov, Vladimir P. System of current supply buses for aluminum-producing electrolyzers. 4,250,012, Cl. 204-243.00M.
Kamimori, Shigeru: *See*—
Fujita, Kiyoshi; Ito, Yukiyoshi; and Kamimori, Shigeru, 4,250,328, Cl. 560-205.000.
Kammerling, Bruno; and Kubbutat, Axel, to Gutehoffnungshutte Sterkrade Aktiengesellschaft. Cooling device for smelting plants. 4,249,723, Cl. 266-193.000.
Kamoshita, Katsuzo: *See*—
Takemoto, Ichiki; Sumida, Seizo; Yoshida, Ryo; and Kamoshita, Katsuzo, 4,249,938, Cl. 71-98.000.
Kanamaru, Hisanobu; Tatsumi, Hideo; Okabe, Moisei; and Tohkairin, Akira, to Hitachi, Ltd. Method for connecting two members. 4,249,298, Cl. 29-520.000.
Kane, Vinayak V.; and Levine, Seymour D., to Ortho Pharmaceutical Corporation. Method of treating arrhythmia. 4,250,180, Cl. 424-250.000.
Kanemaru, Kenji; and Iwasaki, Takashiroh, to Hitachi, Ltd. Automatic control circuit system for cameras provided with a focal-plane shutter having front and rear screens. 4,249,809, Cl. 354-23.00D.
Kannal, Gregory A.: *See*—
Tsang, Frederick; Kannal, Gregory A.; and Hoff, Marcian E., Jr., 4,250,570, Cl. 365-200.000.
Kanou, Toshiyuki: *See*—
Musha, Toshimitsu; Harumi, Kenichi; Teramachi, Yasuaki; and Kanou, Toshiyuki, 4,249,538, Cl. 128-630.000.
Kantner, Harold H. Fluid-power converter with paired rotators providing seals and displacement paths and pump-motor utilizing same. 4,249,750, Cl. 280-216.000.
Kanzaki Paper Manufacturing Co., Ltd.: *See*—
Fujioka, Hironari, 4,250,228, Cl. 428-539.000.
Kao Soap Co., Ltd.: *See*—
Katabe, Kenichi; Hirota, Takeshi; and Wakasugi, Osamu, 4,250,047, Cl. 252-49.500.
Okada, Eisaburo; and Sakagami, Koji, 4,249,948, Cl. 106-88.000.
Karabinos, Joseph V.; and Nickell, Louis G., to W. R. Grace & Co. Derivatives of thiophene. 4,250,319, Cl. 549-61.000.
Karakovsky, Alexandr K.: *See*—
Mikhailov, Viktor V.; Karakovsky, Alexandr K.; Dyachenko, Petr Y.; Ivanov, Jury S.; Mikhailov, Igor V.; Lunin, Mikhail G.; Buyanov, Alexei V.; Konstantinov, Alexei A.; Shagurin, Anatoly S.; Kirillov, Alexandr P.; Mikhailov, Oleg V.; and Khaimov, Arkady S., 4,249,871, Cl. 425-111.000.
Karns, Ward L.: *See*—
Harlow, James L.; and Karns, Ward L., 4,250,513, Cl. 346-153.100.
Karol, Herman S.: *See*—
Darwent, Richard H.; Phillips, George R.; and Karol, Herman S., 4,249,640, Cl. 187-1.00R.
Karpati, Egon: *See*—
Felfoldi, Karoly; Apjok, Jozsef; Bartok, Mihaly; Czombos, Jozsef; Molnar, Arpad; Noteisz, Ferenc; Karpati, Egon; and Szporny, Laszlo, 4,250,310, Cl. 544-379.000.
Karr, Edward J., to B. W. Darrah, Inc. Rotating nibbler apparatus. 4,249,309, Cl. 30-240.000.
Karras, Ernest C. Telephone day count traffic observing and data accumulating equipment. 4,250,354, Cl. 179-8.00A.
Karwat, Heinz; Lang, Roland; and Jelend, Wolfgang, to Linde Aktiengesellschaft. Process for the treatment of gaseous mixtures, which contain sour gases, with organic solvents. 4,250,150, Cl. 423-226.000.
Kasak, August: *See*—
Haswell, Walter T.; and Kasak, August, 4,249,945, Cl. 75-241.000.
Kashiwa, Norio: *See*—
Minami, Syuji; Toyota, Akinori; and Kashiwa, Norio, 4,250,285, Cl. 526-125.000.
Kasper, Robin: *See*—
Trenkle, Robert W.; Mookherjee, Braja D.; Hall, John B.; Kasper, Robin; Vock, Manfred H.; Schreck, Ronald; Granda, Edward J.; and Vinals, Joaquin F., 4,250,332, Cl. 568-347.000.
Katabe, Kenichi; Hirota, Takeshi; and Wakasugi, Osamu, to Kao Soap Co., Ltd. Lubricant compositions for synthetic fibers and method for lubricating synthetic fibers. 4,250,047, Cl. 252-49.500.
Katayama, Masato: *See*—
Marumo, Shingo; and Katayama, Masato, 4,250,120, Cl. 568-445.000.
Katayama, Mitsumasa; and Suemitsu, Masayasu, to Matsushita Electronics Corporation. Envelope for camera tube. 4,249,668, Cl. 220-2.10R.
Kato, Hiroshi: *See*—
Maekawa, Hideyuki; Takagishi, Yasushi; and Kato, Hiroshi, 4,250,166, Cl. 424-81.000.
Kato, Masahiko: *See*—
Seki, Ikuo; and Kato, Masahiko, 4,250,522, Cl. 358-76.000.
Katoh, Masayoshi; Ishii, Takashi; and Nagaoka, Tadahiko, to Nissan Motor company, Limited. Combusting device for generation of a combustion gas. 4,249,673, Cl. 222-3.000.
Kattner, Erich; Rosenstock, Guetner; and Kern, Hans, to Siemens Aktiengesellschaft. Heating device for recording heads in ink mosaic recorders. 4,250,512, Cl. 346-140.00R.
Kaufhold, Manfred; and Jacquemin, Werner, to Chemische Werke Huls Aktiengesellschaft. Process for the preparation of pure α,ω-C_6- to C_{20}-alkenols. 4,250,343, Cl. 568-903.000.
Kaufhold, Manfred: *See*—
zur Hausen, Manfred; Kaufhold, Manfred; and Lange, Erhard, 4,250,337, Cl. 568-853.000.
Kaufman, Lance R. Variable resistance device for thick film circuitry. 4,250,481, Cl. 338-163.000.
Kawaguchi, Hiroshi; Konishi, Masataka; Tsuno, Takashi; and Miyaki, Takeo, to Bristol-Myers Company. Antibacterial agents Bu-2349A and B and method of using same. 4,250,170, Cl. 424-181.000.
Kawai Musical Instrument Mfg. Co. Ltd.: *See*—
Deutsch, Ralph; and Deutsch, Leslie J., 4,249,448, Cl. 84-1.230.
Kawana, Takashi: *See*—
Iwataki, Isao; Shibuya, Masami; Ishikawa, Hisao; and Kawana, Takashi, 4,249,937, Cl. 71-97.000.
Kawasaki, Kaoru; and Umehara, Masakazu, to Tenchi Kikai Kabushiki Kaisha. Heat-seal type wrapping apparatus. 4,249,364, Cl. 53-550.000.
Kawasaki, Masahiro; and Sawada, Yoshio, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera power supply maintaining circuit. 4,250,413, Cl. 307-293.000.
Kawasaki Motors Corp. U.S.A.: *See*—
Fields, Samuel; and Anderson, Wesley J., 4,249,626, Cl. 180-54.00A.
Kawasaki Steel Corporation: *See*—
Ichida, Toshio; Komatsubara, Michiro; and Shimanaka, Hiroshi, 4,249,966, Cl. 148-113.000.
Kawashima, Masao; Okada, Hisanao; and Kikuchi, Bun, to Fujitsu Limited. Method of manufacturing an optical fiber. 4,249,925, Cl. 65-3.00A.
Kazamir, Raymond, to General Electric Company. Battery charger adapter including snap type assembly means. 4,250,443, Cl. 320-2.000.
Kazigase, Masahiro: *See*—
Uejima, Hiroyuki; Hirai, Masahide; and Kazigase, Masahiro, 4,250,031, Cl. 210-688.000.
Kear, Bernard H.; and King, William H., to United Technologies Corporation. Interlayers with amorphous structure for brazing and diffusion bonding. 4,250,229, Cl. 428-606.000.
Kearney-National, Inc.: *See*—
Hanke, Kenneth E., 4,250,357, Cl. 200-50.00A.
Keene Corporation: *See*—
Meyer, John A., 4,249,648, Cl. 194-102.000.
Kefeli, Tamara Y.: *See*—
Efimov, Alexei V.; Berlin, Alfred A.; Kefeli, Tamara Y.; Varlamova, Nina V.; Strongin, Grigory M.; Altshuler, Judif M.; and Kolomazov, Boris I., 4,250,322, Cl. 560-26.000.
Keifer, Siegfried; and Volz, Hans G., to Bayer Aktiengesellschaft. Air pore lacquers containing white pigments or white fillers. 4,249,953, Cl. 106-193.00R.
Keller, Douglas V., Jr.: *See*—
Smith, Clay D.; and Keller, Douglas V., Jr., 4,249,699, Cl. 241-20.000.
Keller, Harold A.; and Glover, Clinton G., to Cytron, Inc. Spring assembly for ball throwing machines. 4,249,508, Cl. 124-80.000.
Kelley, Albert W. Method and apparatus for cutting sheet material. 4,249,438, Cl. 83-53.000.

Kelley, William J.: *See*—
Crain, Philip W.; Kelley, William J.; and Shoff, Daniel J., 4,249,339, Cl. 46-232.000.

Kelmar, John J. Electrically heated by-product coke oven. 4,249,996, Cl. 202-133.000.

Kemp, Willard E. Method and apparatus for preheating, positioning and holding objects. 4,249,889, Cl. 432-11.000.

Kempa, John F. Plumbing fixture with integral strainer. 4,250,037, Cl. 210-310.000.

Kennametal Inc.: *See*—
Grab, George P.; Hood, Grant W., Jr.; Swanson, Sigurd A.; and Nemeth, Bela J., 4,249,955, Cl. 106-308.00Q.

Kennecott Copper Corporation: *See*—
Wilder, Thomas C., 4,249,998, Cl. 204-16.000.

Kenney, Charlie W.: *See*—
Ruskin, Richard P.; Zafar, Humayon Z.; Goens, Duane N.; Hyatt, David E.; and Kenney, Charlie W., 4,250,157, Cl. 423-417.000.

Kennis, Ludo E. J.: *See*—
Vandenberk, Jan; Kennis, Ludo E. J.; Van der Aa, Marcel J. M. C.; and Van Heertum, Albert H. M. T., 4,250,176, Cl. 424-250.000.

KeNova AB: *See*—
Nilson, Billy N., 4,249,675, Cl. 222-207.000.

Keogh, Boyd T. Pozzolanic product produced from bagasse ash. 4,249,954, Cl. 106-288.00B.

Keresztes, Stephan L.: *See*—
Sandrock, Gary D.; and Keresztes, Stephan L., 4,249,940, Cl. 75-122.000.

Kerfoot, Frank W., Jr., to Syntex (U.S.A.) Inc. Compliantly mountable turbine cartridge assembly for gas-driven dental handpiece. 4,249,896, Cl. 433-132.000.

Kerk Motion Products, Inc.: *See*—
Erikson, Kenneth W.; and Erikson, Keith W., 4,249,426, Cl. 74-441.000.

Kern, Hans: *See*—
Kattner, Erich; Rosenstock, Guetner; and Kern, Hans, 4,250,512, Cl. 346-140.00R.

Kernforschungsanlage Julich Gesellschaft m.b.H.: *See*—
Eggeling, Lothar; Paschke, Manfred; and Sahm, Hermann, 4,250,261, Cl. 435-190.000.

Kerr-McGee Corporation: *See*—
Leonard, Robert E., 4,249,951, Cl. 106-103.000.

Kerr, Robert J. Apparatus for loading, unloading and stacking hay bales. 4,249,843, Cl. 414-44.000.

Kerschner, Guenther: *See*—
Papendieck, Friedrich; Kerschner, Guenther; Verfuerth, Rolf-Peter; and Rabold, Juergen, 4,250,561, Cl. 364-900.000.

Kervagoret, Gilbert, to Societe Anonyme DBA. Hydraulic servo-mechanism. 4,249,455, Cl. 91-383.000.

Kester, Dennis E.: *See*—
Guarnery, Joseph M.; and Kester, Dennis E., 4,250,006, Cl. 204-159.180.
Schlesinger, Sheldon I.; and Kester, Dennis E., 4,250,203, Cl. 427-44.000.

Keyes, Marion A., IV; Malcolm, Jack W.; and Thompson, William L., to Babcock & Wilcox Company, The. Hybrid analog function generator. 4,250,558, Cl. 364-607.000.

Khaimov, Arkady S.: *See*—
Mikhailov, Viktor V.; Karakovsky, Alexandr K.; Dyachenko, Petr Y.; Ivanov, Jury S.; Mikhailov, Igor V.; Lunin, Mikhail G.; Buyanov, Alexei V.; Konstantinov, Alexei A.; Shagurin, Anatoly S.; Kirillov, Alexandr P.; Mikhailov, Oleg V.; and Khaimov, Arkady S., 4,249,871, Cl. 425-111.000.

Khlopkov, Leonid P.: *See*—
Kalmykov, Vladimir N.; Musiiko, Vitaly A.; Khlopkov, Leonid P.; Gashenko, Stanislav I.; Rogatkin, Alexandr A.; Silakov, Grigory I.; Shipilov, Viktor F., deceased; Skibina, Elena S., administrator; Shipilov, Gennady V., administrator; and Shipilov, Fedor D., administrator, 4,249,989, Cl. 159-10.000.

Kiefer, Edward H.; Lysenko, George P.; and Cade, Richard L., to Deere & Company. Vehicle motion alarm. 4,250,486, Cl. 340-52.00R.

Kienzle Apparate GmbH: *See*—
Dold, Berthold, 4,249,745, Cl. 369-219.000.

Kienzle, John A. Sound level detector with program interrupt. 4,250,499, Cl. 340-566.000.

Kihara, Keiichi: *See*—
Sakamoto, Teruhisa; Sekizawa, Kazuhiko; and Kihara, Keiichi, 4,250,339, Cl. 568-471.000.

Kihara, Toshimasa; and Tsukada, Toshiro, to Hitachi, Ltd. Analog-to-digital converter employing constant-current circuit incorporating MISFET. 4,250,493, Cl. 340-347.0NT.

Kikuchi, Bun: *See*—
Kawashima, Masao; Okada, Hisanao; and Kikuchi, Bun, 4,249,925, Cl. 65-3.00A.

Kiloking (Proprietary) Limited: *See*—
Mostert, Jacob J.; and Henderson, Henning M., 4,250,485, Cl. 340-52.00R.

Kim Hotstart Manufacturing Co., Inc.: *See*—
Stein, John, 4,249,491, Cl. 123-142.50R.

Kimberlin, Dan R., to General Motors Corporation. Floor mounted shift control mechanism for a transmission. 4,249,404, Cl. 70-248.000.

Kimblin, Clive W.; Holmes, Francis A.; Heberlein, Joachim V. R.; Gorman, Joseph G.; and Slade, Paul G., to Electric Power Research Institute, Inc. Vacuum arc current limiter with oscillating transverse magnetic field and method. 4,250,364, Cl. 200-144.00B.

Kimura, Hiroshi, to Hughes Aircraft Company. Method of growing large $Pb_{1-x}Sn_xTe$ single crystals where $0<X<1$. 4,249,987, Cl. 156-603.000.

Kimura, Morihiro; Yamamoto, Kenji; and Nose, Masahiko, to Shinagawa Refractories Co., Ltd. Sector sliding plate brick having discharge ports and an improved sliding nozzle apparatus. 4,249,680, Cl. 222-598.000.

Kimura, Taro: *See*—
Tsubuko, Kazuo; Kimura, Taro; Tasaka, Motoo; and Hashimoto, Junichiro, 4,250,241, Cl. 430-114.000.

Kindell, Jerry L., to Honeywell Information Systems Inc. Computer apparatus. 4,250,548, Cl. 364-200.000.

King, Lloyd H., Sr. Inline dispersal valve. 4,249,562, Cl. 137-268.000.

King, Reynold C., to Emerson Electric Co. Electric heating elements. 4,250,399, Cl. 219-532.000.

King, William H.: *See*—
Kear, Bernard H.; and King, William H., 4,250,229, Cl. 428-606.000.

Kioritz Corporation: *See*—
Inaga, Hisashi, 4,249,311, Cl. 30-276.000.

Kirillov, Alexandr P.: *See*—
Mikhailov, Viktor V.; Karakovsky, Alexandr K.; Dyachenko, Petr Y.; Ivanov, Jury S.; Mikhailov, Igor V.; Lunin, Mikhail G.; Buyanov, Alexei V.; Konstantinov, Alexei A.; Shagurin, Anatoly S.; Kirillov, Alexandr P.; Mikhailov, Oleg V.; and Khaimov, Arkady S., 4,249,871, Cl. 425-111.000.

Kirner, Ernest O., to Bendix Corporation, The. Independent landing monitor. 4,250,505, Cl. 343-5.0LS.

Kirsch, Howard C., to Bell Telephone Laboratories, Incorporated. Voltage generator circuitry. 4,250,414, Cl. 307-296.00A.

Kiser, Ernest J.; and Latty, James A., to Rohm and Haas Company. Coated membranes. 4,250,029, Cl. 210-652.000.

Kitagawa, Hiroji, to Kitagawa Industries Co., Ltd. Clamping device for cables and the like. 4,250,348, Cl. 174-65.0SS.

Kitagawa Industries Co., Ltd.: *See*—
Kitagawa, Hiroji, 4,250,348, Cl. 174-65.0SS.

Kitahira, Takashi: *See*—
Ogawa, Kazuki; Furukawa, Mitsuhiko; Hara, Yoshimichi; and Kitahira, Takashi, 4,249,914, Cl. 51-309.000.

Kitajima, Masao: *See*—
Kondo, Asaji; Kitajima, Masao; and Hatanaka, Isamu, 4,250,010, Cl. 204-195.00M.

Kitamoto, Tatsuji: *See*—
Shirahata, Ryuji; Kitamoto, Tatsuji; Suzuki, Masaaki; and Amari, Hiroshi, 4,250,225, Cl. 428-336.000.

Kitko, David J., to Procter & Gamble Company, The. Apparatus for sanitizing toilets. 4,249,274, Cl. 4-227.000.

Kito, Yastami: *See*—
Tsuzuki, Kanemitsu; Motobayashi, Kozo; Watanabe, Kazuo; Kito, Yastami; and Seko, Shigeo, 4,249,369, Cl. 57-263.000.

Kiwala, Jacob: *See*—
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Vinals, Joaquin F.; Kiwala, Jacob; and Schmitt, Frederick L., 4,250,201, Cl. 426-538.000.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,250,342, Cl. 568-826.000.
Wilson, Richard A.; Schreiber, William L.; Mookherjee, Braja D.; Kiwala, Jacob; Vinals, Joaquin F.; Vock, Manfred H.; Stork, Gilbert; and Schmitt, Frederick L., 4,250,049, Cl. 252-174.110.

Klaar, Richard, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile track tamping machine. 4,249,468, Cl. 104-12.000.

Klapp, Hartmut, to Jagenberg-Werke AG. Transport apparatus for a carton filling machine. 4,249,360, Cl. 53-244.000.

Klauck, Bernd; and Wolff, Michael, to Siemens Aktiengesellschaft. Resolution for a raster display. 4,250,502, Cl. 340-728.000.

Kleczkowski, Stawomir P.; and Ross, Rupert F., to International Business Machines Corporation. Method and apparatus for opening disk packs. 4,250,529, Cl. 360-98.000.

Kleiner, Hans-Jerg: *See*—
Dursch, Walter; Linke, Fritz; and Kleiner, Hans-Jerg, 4,250,124, Cl. 260-928.000.

Klemarczyk, Philip: *See*—
Sprecker, Mark A.; Sanders, James M.; Schreiber, William L.; Watkins, Hugh; Vinals, Joaquin F.; Shuster, Edward J.; O'Rourke, Thomas J.; Hagedorn, Myrna L.; and Klemarczyk, Philip, 4,250,338, Cl. 568-343.000.

Klemm, Gerhard. Device for intermittent feeding of webs. 4,249,688, Cl. 226-24.000.

Kleykamp, Donald L., to Dayco Corporation. Railway vehicle wear member. 4,249,665, Cl. 213-61.000.

Kliklok Corporation: *See*—
Baker, Thomas R., 4,249,978, Cl. 156-291.000.

Klockner-Humboldt-Deutz AG: *See*—
Brachthauser, Kunibert; Ramesohl, Hubert; and Herchenbach, Horst, 4,249,892, Cl. 432-14.000.

Kneer, Franz. Method of digesting organic wastes. 4,249,929, Cl. 71-9.000.

Knight, George W.: *See*—
Lowery, Kirby, Jr.; Knight, George W.; and May, James A., Jr., 4,250,288, Cl. 526-137.000.

Kniskern, Peter J.: *See*—
Carlo, Dennis J.; Hagopian, Arpi; and Kniskern, Peter J., 4,250,265, Cl. 435-272.000.

Knox, L. Carter: *See*—
Streich, Steven G.; Knox, L. Carter; and Sullaway, Bob L., 4,249,576, Cl. 138-89.000.
Knuppel, Helmut; Brotzmann, Karl; Fassbinder, Hans-Georg; and Fritz, Ernst, to Eisenwerk-Gesellschaft Maximilianshutte mbH. Tuyere for the injection of reaction gas. 4,249,719, Cl. 266-47.000.
Ko, Wen H.; Fleming, David G.; Derda, Harry J.; and Martin, William O., to Case Western Reserve University. Continuous positive airway pressure administrating apparatus. 4,249,527, Cl. 128-204.180.
Kobayashi, Yasuo: *See*—
Sasaki, Nobuo; Nakano, Moto'o; Kobayashi, Yasuo; and Iwai, Takashi, 4,250,569, Cl. 365-185.000.
Kobe, Inc.: *See*—
Erickson, John W., 4,249,860, Cl. 415-111.000.
Kocatas, Babur M.: *See*—
Argo, Wesley B.; Kocatas, Babur M.; and Ziebold, S. A., 4,249,918, Cl. 55-97.000.
Koch, Friedrich; and Thiele, Norbert, to Desma-Werke GmbH. Die casting system for the production of rubber mouldings. 4,249,882, Cl. 425-547.000.
Koch, Lehel, to Vepex Fovallalkopasi Iroda Rt. Method for processing plant protein. 4,250,197, Cl. 426-51.000.
Koga, Haruyoshi, to Hachinohe Smelting Co., Ltd. Repairing mortars for silicon carbide bricks. 4,249,947, Cl. 106-57.000.
Kohjin Co., Ltd.: *See*—
Saito, Motoyasu; and Mukohyama, Hideaki, 4,250,305, Cl. 536-84.000.
Kohler Co.: *See*—
Greene, Norman D., 4,249,592, Cl. 165-1.000.
Kohler, Thomas P., to Beatrice Foods Co. Touch dimmer circuit. 4,250,432, Cl. 315-291.000.
Koide, Hiroshi: *See*—
Watanabe, Junichi; Koide, Hiroshi; and Temmyo, Shigemoto, 4,250,416, Cl. 310-13.000.
Kokado, Hiroshi: *See*—
Miyakawa, Nobuhiro; Kokado, Hiroshi; and Inoue, Eiichi, 4,250,250, Cl. 430-374.000.
Koliwad, Krishna M.: *See*—
United States of America, National Aeronautics and Space Administration; Koliwad, Krishna M.; and Daud, Taher, 4,249,957, Cl. 136-258.000.
Kollmai, Klaus E. Volatile hydrocarbon detector apparatus. 4,250,142, Cl. 422-68.000.
Kolomazov, Boris I.: *See*—
Efimov, Alexei V.; Berlin, Alfred A.; Kefeli, Tamara Y.; Varlamova, Nina V.; Strongin, Grigory M.; Altshuler, Judif M.; and Kolomazov, Boris I., 4,250,322, Cl. 560-26.000.
Kolosov, Ivan A.; Kuryshev, Nikolai V.; Ivanyatov, Jury E.; Kalininskaya, Vera N.; Yartsev, Igor K.; Pugachev, Arkady K.; and Savina, Svetlana M. Method for impregnation of cermet electrodes of an alkaline storage battery. 4,250,204, Cl. 427-58.000.
Komarek, Karl R., to K. R. Komarek, Inc. Briquetting press. 4,249,878, Cl. 425-237.000.
Komatsubara, Michiro: *See*—
Ichida, Toshio; Komatsubara, Michiro; and Shimanaka, Hiroshi, 4,249,966, Cl. 148-113.000.
Komiya, Osamu, to Olympus Optical Co., Ltd. Laser knife. 4,249,533, Cl. 128-303.100.
Konaka, Minoru: *See*—
Nakajima, Koichi; Ishiguro, Tomoji; Okamoto, Tokuhiko; Konaka, Minoru; Nagai, Minoru; Higuchi, Kanji; and Sasaki, Kenji, 4,250,426, Cl. 313-143.000.
Kondo, Asaji; Kitajima, Masao; and Hatanaka, Isamu, to Fuji Photo Film Corporation. Integrated ion selection electrode device. 4,250,010, Cl. 204-195.00M.
Konishi, Masataka: *See*—
Kawaguchi, Hiroshi; Konishi, Masataka; Tsuno, Takashi; and Miyaki, Takeo, 4,250,170, Cl. 424-181.000.
Konstantin, Peter: *See*—
Lehmann, Hans-Dieter; and Konstantin, Peter, 4,250,141, Cl. 422-44.000.
Konstantinov, Alexei A.: *See*—
Mikhailov, Viktor V.; Karakovsky, Alexandr K.; Dyachenko, Petr Y.; Ivanov, Jury S.; Mikhailov, Igor V.; Lunin, Mikhail G.; Buyanov, Alexei V.; Konstantinov, Alexei A.; Shagurin, Anatoly S.; Kirillov, Alexandr P.; Mikhailov, Oleg V.; and Khaimov, Arkady S., 4,249,871, Cl. 425-111.000.
Koppe, Herbert: *See*—
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Hoefke, Wolfgang; Gaida, Wolfram; and Pichler, Ludwig, 4,250,186, Cl. 424-273.00R.
Koppelmann, Edgar: *See*—
Smolka, Heinz G.; and Koppelmann, Edgar, 4,249,903, Cl. 8-137.000.
Korenev, Vladimir P.; Ippolitov, Jury S.; Belyaev, Boris P.; Kalninsh, Arvid Y.; Vedernikov, Nikolai A.; Krastinsh, Valter P.; Abolinsh, Guntis K.; Abele, Karl M.; and Ekis, Felix A. Apparatus for mechanical and chemical destruction of polysaccharides of younger slightly decomposed peat. 4,249,703, Cl. 241-247.000.
Kostin, Albert A.: *See*—
Kaluzhsky, Nikolai A.; Gefter, Semen E.; Tsybukov, Igor K.; Evdokimov, Svetozar V.; Derkach, Alexei S.; Tsyplakov, Anatoly M.; Lankin, Valery P.; Velichko, Boris P.; Kostin, Albert A.; Volfson, Grigory E.; and Nikiforov, Vladimir P., 4,250,012, Cl. 204-243.00M.
Kotani, Teizo; Matsumoto, Shuichi; Igarashi, Katsutoshi; and Suzuki, Kazuo, to Japan Synthetic Rubber Co., Ltd. Method for chain-opening polymerization of norbornene derivatives. 4,250,063, Cl. 260-4.00R.
Kotwicki, Allan J., to General Motors Corporation. Apparatus for measuring engine torque. 4,249,416, Cl. 73-133.00R.
Kotyk, Jeffery M., to McNeil Corporation. Pump for high viscosity lubricants with improved priming feature. 4,249,868, Cl. 417-511.000.
Kouchich, Allan V.; Radosevich, Lawrence D.; Blanchard, John C.; and Thomas, Neal F., to Allen-Bradley Company. Packaged electronic component and method of preparing the same. 4,250,482, Cl. 338-275.000.
Kouloheris, Anastasios P.; and LeFever, JoAnne, to Gardinier, Inc. Method of purifying phosphoric acid after solvent extraction. 4,250,155, Cl. 423-321.00R.
Koyama, Tomiyasu; Horimoto, Masashi; and Horimoto, Midori, to Hokkaido University, President of. Optical somato-measuring apparatus. 4,249,540, Cl. 128-666.000.
Kozlin, Joseph R.: *See*—
Benyi, Alexander, Jr.; and Kozlin, Joseph R., 4,249,859, Cl. 415-79.000.
Krabbe, Wilfried; and Simon, Walter, to Philipp Holzmann AG. Climbing framework for erecting concrete forms in the manufacture of straight or curved reinforced concrete walls. 4,249,870, Cl. 425-63.000.
Kraft, Joseph K., to Westinghouse Electric Corp. Escalator having yieldable primary and non-yieldable secondary transverse guide points on one side thereof. 4,249,649, Cl. 198-332.000.
Kramer, Manfred: *See*—
Gelse, Hans-Dieter; Heger, Werner; and Kramer, Manfred, 4,249,564, Cl. 137-340.000.
Kramer, Martin: *See*—
Lucchini, Erich; and Kramer, Martin, 4,249,632, Cl. 180-274.000.
Krampe & Co. Fertigung in Bergbaubedarf GmbH: *See*—
Best, Gerd F.; and Weikert, Norbert B., 4,249,779, Cl. 299-81.000.
Krastinat, Walter, to BYK Gulden Lomberg Chemische Fabrik GmbH. N-(Substituted amino)alkanoyl-aminoalkanoic acids and salts, their use and their compositions. 4,250,183, Cl. 424-263.000.
Krastinsh, Valter P.: *See*—
Korenev, Vladimir P.; Ippolitov, Jury S.; Belyaev, Boris P.; Kalninsh, Arvid Y.; Vedernikov, Nikolai A.; Krastinsh, Valter P.; Abolinsh, Guntis K.; Abele, Karl M.; and Ekis, Felix A., 4,249,703, Cl. 241-247.000.
Kratz, Wilbur C.: *See*—
Sircar, Shivaji; and Kratz, Wilbur C., 4,249,915, Cl. 55-26.000.
Krause, William F., to Hydril Company. Well safety system. 4,249,599, Cl. 166-72.000.
Krauss-Maffei Aktiengesellschaft: *See*—
Wohlrab, Walter, 4,249,880, Cl. 425-451.200.
Kriedt, Hans, to Siemens Aktiengesellschaft. Dynamic resistor current leakage compensation arrangement. 4,250,411, Cl. 307-264.000.
Krimetz, Wasyl: *See*—
Hapgood, William W.; and Krimetz, Wasyl, 4,249,785, Cl. 312-196.000.
Krisciokaitis, Frank: *See*—
Krisst, Raymond J.; and Krisciokaitis, Frank, 4,249,511, Cl. 126-424.000.
Krishnakumar, Suppayan M.: *See*—
Pocock, John F. E.; Krishnakumar, Suppayan M.; Mahajan, Gautam K.; and Clark, Richard E., 4,249,667, Cl. 215-1.00C.
Krisst, Raymond J.; and Krisciokaitis, Frank. Solar grille. 4,249,511, Cl. 126-424.000.
Kristofek, Paul J., to McGraw-Edison Co. Mounting arrangement for recessed light fixture housing. 4,250,540, Cl. 362-368.000.
Krol, Johannes W. A.: *See*—
Lersmacher, Bernhard; Lydtin, Hans; Seifert, Horst; and Krol, Johannes W. A., 4,250,429, Cl. 313-346.00R.
Kronmiller, Richard E.: *See*—
Meyer, Robert B.; Schaefer, Harold W.; and Kronmiller, Richard E., 4,249,281, Cl. 15-340.000.
Kruckenberg, Winfried; and Schundehutte, Karl H., to Bayer Aktiengesellschaft. Dyestuff formulations. 4,249,902, Cl. 8-525.000.
Krude, Werner; and Harz, Peter, to Uni-Cardan Aktiengesellschaft. Homokinetic universal joint assembly. 4,249,395, Cl. 64-21.000.
Krukemeier, Richard; Merten, Uwe; and Stahlmann, Willi, to Weserhutte AG. Reclaiming buckets for a stockpile reclaimer. 4,249,651, Cl. 198-509.000.
Krump, Robert C.: *See*—
Donnelly, Donald E.; and Krump, Robert C., 4,249,696, Cl. 236-46.00R.
Krzeminski, Melvin L., to G. D. Searle & Co. Instrument for loading an intrauterine device into an insertion tube. 4,249,525, Cl. 128-130.000.
Kubbutat, Axel: *See*—
Kammerling, Bruno; and Kubbutat, Axel, 4,249,723, Cl. 266-193.000.
Kubota, Naohiro: *See*—
Nakahara, Yutaka; Kubota, Naohiro; and Shibata, Toshihiro, 4,250,312, Cl. 546-19.000.
Nakahara, Yutaka; Kubota, Naohiro; and Shibata, Toshihiro, 4,250,313, Cl. 546-19.000.
Kubota, Shigeo; Kurousu, Asao; and Hayakawa, Shozaburo, to Sony Corporation. Gas laser. 4,250,467, Cl. 331-94.50D.
Kuck, Mark A.; Miller, Gary K.; and Coll-Palagos, Miguel, to Stauffer Chemical Company. Electrochemical process for metal alkoxides. 4,250,000, Cl. 204-59.0QM.
Kufferath-Kassner, Karl, to GKD Gebr. Kufferath GmbH & Co. KG. Wire mesh band. 4,249,653, Cl. 198-848.000.

Kuhnle, Ernst, to Bizerba-Werke Wilhelm Kraut KG. Bending force receiver. 4,249,624, Cl. 177-211.000.
Kuit, Wouterus J. M.; and Babcock, Alan R., to Cominco Ltd. Process for the removal of cyanides from effluent. 4,250,030, Cl. 210-684.000.
Kulaga, Matthew S.: *See*—
Golden, Ronald; Kulaga, Matthew S.; and Shatynski, Stephen, 4,250,076, Cl. 260-38.000.
Kulsa, Peter: *See*—
Bochis, Richard J.; Kulsa, Peter; and Tolman, Richard L., 4,250,174, Cl. 424-248.500.
Kummer, Werner: *See*—
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Hoefke, Wolfgang; Gaida, Wolfram; and Pichler, Ludwig, 4,250,186, Cl. 424-273.00R.
Kundrath, Michael R.: *See*—
Warren, John B.; and Kundrath, Michael R., 4,250,127, Cl. 264-22.000.
Kung, Roger I.; and Moench, Jerry D., to Motorola, Inc. Dynamic output buffer. 4,250,412, Cl. 307-279.000.
Kunkel, Heinrich: *See*—
Olschewski, Armin; Kunkel, Heinrich; Brandenstein, Manfred; and Walter, Lothar, 4,249,781, Cl. 308-8.200.
Kunnel, Werner: *See*—
Hugl, Herbert; Wolfrum, Gerhard; Reel, Henning; Kunnel, Werner; Kuth, Robert; and Gohrbandt, Wilhelm, 4,249,275, Cl. 8-532.000.
Kuo, Ted L. C.: *See*—
Weinmann, Karl; Kuo, Ted L. C.; and Greenwood, William S., 4,249,303, Cl. 29-868.000.
Weinmann, Karl; and Kuo, Ted L. C., 4,249,304, Cl. 29-872.000.
Kupstis, John D.: *See*—
Cuomo, Jerome J.; Gambino, Richard J.; Harper, James M.; and Kupstis, John D., 4,250,009, Cl. 204-192.00N.
Kurandt, Uwe: *See*—
Goedecke, Ralf; Liebert, Martin; Nischk, Wolfgang; Kurandt, Uwe; and Mewes, Dieter, 4,250,308, Cl. 544-190.000.
Kurimoto, Tatsuo: *See*—
Tsuda, Tetsuaki; and Kurimoto, Tatsuo, 4,249,999, Cl. 204-28.000.
Kurousu, Asao: *See*—
Kubota, Shigeo; Kurousu, Asao; and Hayakawa, Shozaburo, 4,250,467, Cl. 331-94.50D.
Kuryshev, Nikolai V.: *See*—
Kolosov, Ivan A.; Kuryshev, Nikolai V.; Ivanyatov, Jury E.; Kalininskaya, Vera N.; Yartsev, Igor K.; Pugachev, Arkady K.; and Savina, Svetlana M., 4,250,204, Cl. 427-58.000.
Kuth, Robert: *See*—
Hugl, Herbert; Wolfrum, Gerhard; Reel, Henning; Kunnel, Werner; Kuth, Robert; and Gohrbandt, Wilhelm, 4,249,275, Cl. 8-532.000.
Kutzner, Luitpold: *See*—
Diermayer, Werner; Kutzner, Luitpold; and Postenreider, Erwin, 4,249,694, Cl. 236-1.00G.
Kvita, Vratislav; Zweifel, Hans; and Greber, Gerd, to Ciba-Geigy Corporation. 3- and 4-Azidophthalic acid derivatives. 4,250,096, Cl. 260-326.00N.
Kyowa Yuka Co., Ltd.: *See*—
Fujita, Kiyoshi; Ito, Yukiyoshi; and Kamimori, Shigeru, 4,250,328, Cl. 560-205.000.
La Precision Industrielle: *See*—
Le Moal, Jean P., 4,249,451, Cl. 91-1.000.
Laboratoires Biotrol S.A.: *See*—
Studievic, Claude; Brossard, Guy; and Yribarren, Philippe, 4,249,826, Cl. 356-244.000.
Lacroix, Bernard, to Cycles Peugeot. Antitheft device for a moped. 4,249,751, Cl. 280-289.00L.
Lafitte, Andre: *See*—
Gabbay, Emile; Tran Quand, Dang; and Lafitte, Andre, 4,250,425, Cl. 313-60.000.
Lajack, Joseph. Rotary tiller and attachment therefor. 4,249,612, Cl. 172-43.000.
Lamb, Owen L. Apparatus for viewing and sorting photographic slide transparencies. 4,249,329, Cl. 40-361.000.
Lambert, Robert W.: *See*—
Atherton, Frank R.; Hall, Michael J.; Hassall, Cedric H.; Lambert, Robert W.; and Ringrose, Peter S., 4,250,085, Cl. 260-112.50R.
Lampe, Siegfried; and Neubuser, Siegmar, to E. C. H. Will (GmbH & Co.). Apparatus for accumulating stacks of note books or the like. 4,249,844, Cl. 414-45.000.
Lamplugh, Roland J., to Scott Paper Company. Radiation cross-linked polyurethane foams. 4,250,005, Cl. 204-159.150.
Lamy, Jacques E., to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines. Method and apparatus for the working of underwater deposits. 4,249,618, Cl. 175-9.000.
Lance, Bill W. Method of mounting a tool box on a truck. 4,249,295, Cl. 29-416.000.
Lang, Roland: *See*—
Karwat, Heinz; Lang, Roland; and Jelend, Wolfgang, 4,250,150, Cl. 423-226.000.
Langan, Richard A., to Union Carbide Corporation. Divalent silver oxide cell. 4,250,234, Cl. 429-206.000.
Lange, Erhard: *See*—
zur Hausen, Manfred; Kaufhold, Manfred; and Lange, Erhard, 4,250,337, Cl. 568-853.000.
Langford, Forrest L.: *See*—
Rudy, Michael W.; Langford, Forrest L.; and Therien, Robert D., 4,249,821, Cl. 355-64.000.
Lankin, Valery P.: *See*—
Kaluzhsky, Nikolai A.; Gefter, Semen E.; Tsybukov, Igor K.; Evdokimov, Svetozar V.; Derkach, Alexei S.; Tsyplakov, Anatoly M.; Lankin, Valery P.; Velichko, Boris P.; Kostin, Albert A.; Volfson, Grigory E.; and Nikiforov, Vladimir P., 4,250,012, Cl. 204-243.00M.
Lanza, Emmanuel: *See*—
Morris, Jeff; Brandli, Jacqueline; Lanza, Emmanuel; and Lingier, Willy F. R., 4,250,271, Cl. 525-66.000.
LaRaus, Julius. Method for purifying septic tank effluent. 4,250,040, Cl. 210-760.000.
Larkin, Robert E.; and Piber, Earl T., to Eaton Corporation. Formed pivot for toggle lever and method of making. 4,250,369, Cl. 200-339.000.
Larsen, Ronald P.: *See*—
Webster, Ronald B.; and Larsen, Ronald P., 4,249,807, Cl. 354-4.000.
Larson, William C.: *See*—
Morrell, Roger J.; Larson, William C.; and Schmidt, Robert D., 4,249,777, Cl. 299-4.000.
Lask, Helmut; Holst, Arno; Nischwitz, Ehrenfried; and Sommer, Hans, to Hoechst Aktiengesellschaft. Process and equipment for preparing swellable cross-linked carboxyalkylcelluloses from natural cellulose or cellulose hydrate and use thereof. 4,250,306, Cl. 536-88.000.
Laskin, Allen I.: *See*—
Hou, Ching-Tsang; Patel, Ramesh N.; and Laskin, Allen I., 4,250,259, Cl. 435-148.000.
LaSpisa, Ronald J.; and McElroy, Arthur H., to Phillips Petroleum Company. Control of pipe tension between extruder die and take-up coiler. 4,250,130, Cl. 264-40.700.
Latimer, John P., to Deepsea Ventures, Inc. Steerable ocean floor dredge vehicle. 4,249,324, Cl. 37-58.000.
Latty, James A.: *See*—
Kiser, Ernest J.; and Latty, James A., 4,250,029, Cl. 210-652.000.
Laurel Bank Machine Co., Ltd.: *See*—
Miyazaki, Yorizo, 4,249,363, Cl. 53-508.000.
Sentoku, Hideshi, 4,249,553, Cl. 133-1.00A.
Lavigna, Robert J.; and Reusser, Raymond E., to Western Electric Company, Inc. Growing crystals from a melt by controlling additions of material thereto. 4,249,988, Cl. 156-605.000.
Law, Gabriel H.: *See*—
Foscante, Raymond E.; Gysegem, Albert P.; Martinich, Pamela J.; and Law, Gabriel H., 4,250,074, Cl. 260-32.8EP.
Lawson, William J.: *See*—
Blakeslee, Gerald A., 4,249,283, Cl. 17-51.000.
Lawton, Ernest L., to Monsanto Company. Reinforced acrylic fiber and method for making the same. 4,250,275, Cl. 525-128.000.
Layciak, Stephen G.: *See*—
Johnston, Robert J.; Layciak, Stephen G.; and Dobrosielski, Stephen S., 4,250,368, Cl. 200-307.000.
Layman, Mike D. Brush windrower. 4,249,367, Cl. 56-365.000.
Lazarz, Christine A.; Cook, Edward H., Jr.; and Schulz, Arthur C., to Hooker Chemicals & Plastics Corp. Polymeric microporous separators for use in electrolytic processes and devices. 4,250,002, Cl. 204-98.000.
Leask, John C.: *See*—
Leask, John W.; Leask, John C.; and Straus, Harry W., 4,250,392, Cl. 250-505.000.
Leask, John W.; Leask, John C.; and Straus, Harry W., to Engineering Dynamics Corporation. Bi-focal collimator. 4,250,392, Cl. 250-505.000.
Lebugle, Albert: *See*—
Constant, Georges; Haran, Raymond; Lebugle, Albert; Zaouk, Aref; Morancho, Roland; and Pouvreau, Philippe, 4,250,205, Cl. 427-87.000.
Leclanche S.A.: *See*—
Jeanneret, Rene, 4,250,233, Cl. 429-140.000.
Leclerc, Jean-Francois; and Desbois-Chauvette, Colette, to Service d'Exploitation Industrielle des Tabacs et des Allumettes. Device for automatically taking off elements formed on pieces, particularly on tobacco leaves. 4,249,439, Cl. 83-71.000.
Lee, Hop. Twin electric sockets for outlet box. 4,249,789, Cl. 339-156.00R.
Lee, Martin J.; and Malin, Michael J., to Technicon Instruments Corporation. Whole blood analyses in porous media. 4,250,257, Cl. 435-4.000.
Lee, Maw H., to Scott & Fetzer Company, The. Flexible temperature self regulating heating cable. 4,250,400, Cl. 219-549.000.
Lee, Robert W., to Action Target Products, Inc. Expendable, rapidly replaced, single-part, knock-over, pull cord controlled target element. 4,249,743, Cl. 273-391.000.
Lee, Ronald L.; and Chaconas, Charles G. Current controlled muscle stimulator. 4,249,537, Cl. 128-422.000.
Lee, Shi-Chung, to Chun Zu Machinery Ind. Co., Ltd. Stabilizing means for the cutter of nut former. 4,249,444, Cl. 83-588.000.
Lee, Yu-Kuang. Multiple-purpose closed-loop, automatic control system. 4,250,440, Cl. 318-614.000.
LeFever, JoAnne: *See*—
Kouloheris, Anastasios P.; and LeFever, JoAnne, 4,250,155, Cl. 423-321.00R.
Le Fustec, Richard: *See*—
Claude, Bruno; and Le Fustec, Richard, 4,250,227, Cl. 428-461.000.
Leger, Lucien: *See*—
Baudin, Pol; Leger, Lucien; and Collignon, Pierre, 4,249,958, Cl. 136-251.000.

Lehmann, Hans-Dieter; and Konstantin, Peter, to Gambro Dialysatoren GmbH & Co. KG. Column for the removal of undesired substances from a liquid mixture. 4,250,141, Cl. 422-44.000.

Lehmann, Rolf, to Escher Wyss Ltd. Controlled deflection roll. 4,249,290, Cl. 29-116.0AD.

Lehmann, Wolfgang; Muller, Friedhelm; Lobach, Wilfried; Cramm, Gunther; and Hammerstrom, Knut, to Bayer Aktiengesellschaft. Polyamines containing amide groups. 4,250,298, Cl. 528-342.000.

Lehmann, Wolfgang; Muller, Friedhelm; Cramm, Gunther; Hammerstrom, Knut; and Lobach, Wilfried, to Bayer Aktiengesellschaft. Polyamines containing amide groups. 4,250,299, Cl. 528-342.000.

Lehmann, Wolfgang: *See*—
Lobach, Wilfried; Lehmann, Wolfgang; and Muller, Friedhelm, 4,250,112, Cl. 564-291.000.

Leib, Kenneth G., to Grumman Aerospace Corporation. Radiation beam deflection system. 4,250,465, Cl. 331-94.50D.

Leipelt, Rudolf: *See*—
Behrendt, Bernhard; Brenner, Gerhard; Fischer, Heinz; and Leipelt, Rudolf, 4,249,500, Cl. 123-556.000.

Leitzel, William O.; and Thinesen, Tom. Supporting means for an electrical circuit. 4,250,539, Cl. 362-196.000.

Lell, Rainer; and Lemberg, Werner, to Davy International Aktiengesellschaft. Sulphur condensing apparatus. 4,249,921, Cl. 55-269.000.

Lem, Hans J. Conveyor sortation system. 4,249,661, Cl. 209-564.000.

Lemberg, Werner: *See*—
Lell, Rainer; and Lemberg, Werner, 4,249,921, Cl. 55-269.000.

Le Moal, Jean P., to La Precision Industrielle. Rotary hydraulic jack device. 4,249,451, Cl. 91-1.000.

Leonard, Robert E., to Kerr-McGee Corporation. Process for utilizing mineral-containing residue from coal liquefaction processes. 4,249,951, Cl. 106-103.000.

Le Page, Jean-Francois; Martino, Germain; and Miquel, Jean, to Societe Francaise des Produits pour Catalyse. Catalysts for hydroreforming. 4,250,056, Cl. 252-441.000.

Lersmacher, Bernhard; Lydtin, Hans; Seifert, Horst; and Krol, Johannes W. A., to U.S. Philips Corporation. Electron tube cathode. 4,250,429, Cl. 313-346.00R.

Les Cables de Lyon: *See*—
Sirel, Michel, 4,249,300, Cl. 29-600.000.

Lester, George W.: *See*—
Rohrbach, Ronald P.; and Lester, George W., 4,250,080, Cl. 260-42.460.

Leuca, Walter: *See*—
Moeller, Arnold T., 4,250,396, Cl. 219-218.000.

Levecque, Marc, administrator: *See*—
Levecque, Marcel, deceased; Levecque, Marc, administrator; Batigelli, Jean A.; and Plantard, Dominique, 4,249,926, Cl. 65-5.000.

Levecque, Marcel, deceased; by Levecque, Marc, administrator; Batigelli, Jean A.; and Plantard, Dominique, to Saint-Gobain Industries. Method for jet attenuation of fibers with localized combustion. 4,249,926, Cl. 65-5.000.

Level, Jean-Paul; and Buffard, Guy, to Automobiles Peugeot; and Societe Anonyme Automobiles Citroen. Protecting device in particular for a rod of a telescopic shockabsorber. 4,249,645, Cl. 188-322.000.

Leverenz, Klaus, to Bayer Aktiengesellschaft. Process for diazotizing aromatic amines. 4,250,089, Cl. 260-141.000.

Leveskis, Newton G., to Custom Research and Development. Metal oxide remover containing a strong mineral acid, chelating agent and a basic ammonia derivative. 4,250,048, Cl. 252-142.000.

Levine, Seymour D.: *See*—
Kane, Vinayak V.; and Levine, Seymour D., 4,250,180, Cl. 424-250.000.

Levy, Joseph: *See*—
Rohrbach, Ronald P.; and Levy, Joseph, 4,250,260, Cl. 435-176.000.

Lewiner, Jacques; and Hennion, Claude. Electromechanical transducers. 4,250,415, Cl. 307-400.000.

Lewis, Gilbert W.: *See*—
United States of America, National Aeronautics and Space Administration; Feldstein, Cyril; Lewis, Gilbert W.; Culler, Virgil H.; and Merrbaum, Samuel, 4,249,417, Cl. 73-141.00A.

Ley, Gregor; Penzel, Erich; Rebafka, Walter; and Bott, Kaspar, to BASF Aktiengesellschaft. Aqueous dispersions, containing hydrazine derivatives, of carbonyl-containing copolymers. 4,250,070, Cl. 260-29.6MM.

LGZ Landis & Gyr Zug AG: *See*—
Greenaway, David L., 4,250,217, Cl. 428-161.000.
Greenaway, David L., 4,250,393, Cl. 250-566.000.

Li, Choh H., to Hoffmann-La Roche Inc. Carboxyl terminus analogs of β-endorphin. 4,250,087, Cl. 260-112.50R.

Libby, Craig R., to Scott Paper Company. Coat detection method. 4,250,382, Cl. 250-302.000.

Liebert, Martin: *See*—
Goedecke, Ralf; Liebert, Martin; Nischk, Wolfgang; Kurandt, Uwe; and Mewes, Dieter, 4,250,308, Cl. 544-190.000.

Liebetruth, Reiner: *See*—
Luderer, Gunter; Weinkauf, Burghard; and Liebetruth, Reiner, 4,250,385, Cl. 250-363.00S.

Lietard, Olivier: *See*—
Cases, Jean M.; Valence, Georges; and Lietard, Olivier, 4,250,027, Cl. 209-233.000.

Life Savers, Inc.: *See*—
Cherukuri, Subraman R.; and Friello, Dominick R., 4,250,195, Cl. 426-5.000.
Friello, Dominick R., 4,250,196, Cl. 426-5.000.

Light, Bette M.: *See*—
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,250,194, Cl. 426-3.000.

Limberg, Allen L., to RCA Corporation. Current mirror amplifier. 4,250,461, Cl. 330-288.000.

Lin, Henry C.; and Robota, Stephen, to Hooker Chemicals & Plastics Corp. Process and catalyst mixture for the para-directed chlorination of alkylbenzenes. 4,250,122, Cl. 570-209.000.

Linde Aktiengesellschaft: *See*—
Karwat, Heinz; Lang, Roland; and Jelend, Wolfgang, 4,250,150, Cl. 423-226.000.

Lindsey, David L., to Mustang Services Company. Pipeline treatment apparatus. 4,249,475, Cl. 118-105.000.

Lingier, Willy F. R.: *See*—
Morris, Jeff; Brandli, Jacqueline; Lanza, Emmanuel; and Lingier, Willy F. R., 4,250,271, Cl. 525-66.000.

Link, Manfred; and Puch, Diethelm, to Triumph-Adler A.G. Daisy wheel typewriter. 4,249,829, Cl. 400-144.200.

Linke, Fritz: *See*—
Dursch, Walter; Linke, Fritz; and Kleiner, Hans-Jerg, 4,250,124, Cl. 260-928.000.

Linscott, Phillip S., Jr., to Sundstrand Corporation. Generator with stator retention. 4,250,423, Cl. 310-258.000.

Little, Carl H., to Emerson Electric Co. Retractable caster. 4,249,282, Cl. 16-32.000.

Littlejohn, Calvin. Battery locking means. 4,249,403, Cl. 70-230.000.

Littleton, Ricky V. Releasable window guard. 4,249,345, Cl. 49-56.000.

Liu, Yet-Zen; and Chiang, Shang-Yi, to International Telephone and Telegraph Corporation. Method of manufacturing a light-emitting diode by liquid phase epitaxy. 4,249,967, Cl. 148-171.000.

Lo, David S.: *See*—
Cosimini, Gregory J.; Johnson, Leslie H.; Lo, David S.; Nelson, George F.; and Paul, Maynard C., 4,250,565, Cl. 365-87.000.

Lobach, Wilfried; Lehmann, Wolfgang; and Muller, Friedhelm, to Bayer Aktiengesellschaft. Polyalkylenepolyamines containing quaternary dialkylammonium groups. 4,250,112, Cl. 564-291.000.

Lobach, Wilfried: *See*—
Lehmann, Wolfgang; Muller, Friedhelm; Lobach, Wilfried; Cramm, Gunther; and Hammerstrom, Knut, 4,250,298, Cl. 528-342.000.
Lehmann, Wolfgang; Muller, Friedhelm; Cramm, Gunther; Hammerstrom, Knut; and Lobach, Wilfried, 4,250,299, Cl. 528-342.000.

Lode, Tenny D. Digital multimeter with more closely spaced ranges. 4,250,447, Cl. 324-115.000.

Loeb, Nackey S. Apparatus for mounting an environment controlling sheet. 4,249,589, Cl. 160-368.00R.

Lohmeier, Alfred: *See*—
Bieberbach, George; Bongaards, Donald J.; Lohmeier, Alfred; and Duke, James M., 4,249,593, Cl. 165-70.000.

Lohraff, Larry G.: *See*—
Gaiser, Robert F.; and Lohraff, Larry G., 4,249,379, Cl. 60-562.000.

Loland, Sven, to Sante Fe International Corporation. Offshore drilling control cable clamp system. 4,249,610, Cl. 166-360.000.

Long, Robert B.; Gorbaty, Martin L.; and Vernon, Lonnie W., to Exxon Research & Engineering Co. Coal liquefaction process. 4,250,014, Cl. 208-8.0LE.

Longley, Timothy J. R., to Ingles Hovercraft Associates Limited. System of control for surface effect vehicle. 4,249,628, Cl. 180-117.000.

Lonier, David T.: *See*—
Anderson, Martin C.; and Lonier, David T., 4,249,318, Cl. 434-103.000.

Lorant, Stefan: *See*—
Bratt, Jan C.; Lorant, Stefan; and Pettersson, Kjell A., 4,249,377, Cl. 60-517.000.

Lord Corporation: *See*—
Damico, Dennis J.; and Pascarella, Vincent J., 4,250,274, Cl. 525-127.000.

L'Oreal: *See*—
Bouillon, Claude; Vayssie, Charles; and Richard, Francoise, 4,250,108, Cl. 260-511.000.
Gueret, Jean-Louis H., 4,249,521, Cl. 128-62.00R.

Lorenzen, Heinz-Christen: *See*—
Gretz, Heinz; Rudszinat, Willy; and Lorenzen, Heinz-Christen, 4,249,545, Cl. 131-21.00R.

Lorenzi, Donald E.: *See*—
O'Connor, Donald T.; Lorenzi, Donald E.; Flaherty, John J.; and Schaefer, Edward, 4,249,810, Cl. 354-63.000.

Lougheed, James H.; and Hinz, Lorne C., to Northern Telecom Limited. Plow guidance system. 4,249,630, Cl. 180-168.000.

Lovell, Robert. Process for extruding maraging steel. 4,249,408, Cl. 72-256.000.

Lowery, Kirby, Jr.; Knight, George W.; and May, James A., Jr., to Dow Chemical Company, The. High efficiency, high temperature catalyst for polymerizing olefins. 4,250,288, Cl. 526-137.000.

Lubrizol Corporation, The: *See*—
Higgins, William A., 4,250,042, Cl. 252-8.50C.

Lucchini, Erich; and Kramer, Martin, to Volkswagenwerk Aktiengesellschaft. Safety device for the protection of pedestrians. 4,249,632, Cl. 180-274.000.

Luck, Edward E.; and Daniels, John R., to Collagen Corporation. Microwave sterilization of dry protein. 4,250,139, Cl. 422-21.000.

Luckel, Joachim; and Povel, Rolf, to Daimler-Benz Aktiengesellschaft. Servo-steering mechanism. 4,249,456, Cl. 91-433.000.

Luderer, Gunter; Weinkauf, Burghard; and Liebetruth, Reiner, to Siemens Aktiengesellschaft. Semiconductor X-ray detector. 4,250,385, Cl. 250-363.00S.

Lummus Industries, Inc.: *See*—
Van Doorn, Donald W.; Williams, Roy T.; and Hawkins, James B., 4,249,850, Cl. 414-491.000.

Lundbladh, Tage S. Device for evacuating air from a container. 4,249,583, Cl. 141-65.000.

Lundgren, Roy L. Device for generating electricity by pedestrian and vehicular traffic. 4,250,395, Cl. 290-1.00R.

Lunin, Mikhail G.: *See*—
Mikhailov, Viktor V.; Karakovsky, Alexandr K.; Dyachenko, Petr Y.; Ivanov, Jury S.; Mikhailov, Igor V.; Lunin, Mikhail G.; Buyanov, Alexei V.; Konstantinov, Alexei A.; Shagurin, Anatoly S.; Kirillov, Alexandr P.; Mikhailov, Oleg V.; and Khaimov, Arkady S., 4,249,871, Cl. 425-111.000.

Luque, Rafael F.: *See*—
Haafkens, Rudolf; Luque, Rafael F.; and De Vries, Willem, 4,249,609, Cl. 166-280.000.

Lurex B.V.: *See*—
de Leeuw, Johannes A. N.; and Brugmans, Johannes T., 4,250,209, Cl. 427-250.000.

Lydtin, Hans: *See*—
Lersmacher, Bernhard; Lydtin, Hans; Seifert, Horst; and Krol, Johannes W. A., 4,250,429, Cl. 313-346.00R.

Lysenko, George P.: *See*—
Kiefer, Edward H.; Lysenko, George P.; and Cade, Richard L., 4,250,486, Cl. 340-52.00R.

Lyvers, Daniel L. Apparatus for loading and unloading a vehicle. 4,249,853, Cl. 414-543.000.

Maas, Rudolf J.: *See*—
Bitter, Johan G. A.; Maas, Rudolf J.; and Scheerman, Jacobus H., 4,250,335, Cl. 568-771.000.

Machen, James F. High-speed direct-drive extruder. 4,249,877, Cl. 425-204.000.

Machida, Yoshiharu: *See*—
Nagai, Tsuneji; Machida, Yoshiharu; Suzuki, Yoshiki; and Ikura, Hiroshi, 4,250,163, Cl. 424-14.000.

Machines Chambon: *See*—
Corse, Louis G., 4,249,316, Cl. 34-28.000.

Mack, Karl E.: *See*—
Muller, Werner H.; Mack, Karl E.; and Hey, Hansjorg, 4,250,336, Cl. 568-772.000.

Mackey, Thomas: *See*—
Taylor, Michael C., 4,249,391, Cl. 62-304.000.

MacPherson, William F.: *See*—
Davis, James A.; MacPherson, William F.; and Shackle, Peter W., 4,250,409, Cl. 307-252.00A.

Macriss, Robert A.: *See*—
Elkins, Robert H.; Durkin, Gary M.; and Macriss, Robert A., 4,249,594, Cl. 165-104.00F.

Maczko, Edward M., Jr.: *See*—
Cozzi, John F.; and Maczko, Edward M., Jr., 4,250,039, Cl. 210-416.500.

Maekawa, Hideyuki; Takagishi, Yasushi; and Kato, Hiroshi, to Shionogi & Co., Ltd. Long acting preparation of cefalexin for effective treatments of bacterial infection sensitive to cefalexin. 4,250,166, Cl. 424-81.000.

Maes, Reed A., Jr., to Environmental Research Institute of Michigan. Solar energy collector. 4,249,340, Cl. 47-17.000.

Magicam, Inc.: *See*—
Hilbert, Robert S.; Gustafson, Darryl E.; Harris, Thomas I.; and Rimmer, Matthew P., 4,249,805, Cl. 352-85.000.

Magna Motors Corporation: *See*—
Meckling, John H., 4,250,128, Cl. 264-24.000.

Magnaflux Corporation: *See*—
O'Connor, Donald T.; Lorenzi, Donald E.; Flaherty, John J.; and Schaefer, Edward, 4,249,810, Cl. 354-63.000.

Magnuson, Ellis: *See*—
Hoelzer, E. Clyde; and Magnuson, Ellis, 4,249,900, Cl. 433-79.000.

Magruder, Michael K.: *See*—
Clifford, Jimmie D.; Girsch, David E.; and Magruder, Michael K., 4,249,558, Cl. 137-115.000.

Mahajan, Gautam K.: *See*—
Pocock, John F. E.; Krishnakumar, Suppayan M.; Mahajan, Gautam K.; and Clark, Richard E., 4,249,667, Cl. 215-1.00C.

Mahoff, George A., to Hydraflow Supply, Inc. Flexible coupling. 4,249,786, Cl. 339-15.000.

Malcolm, Jack W.: *See*—
Keyes, Marion A., IV; Malcolm, Jack W.; and Thompson, William L., 4,250,558, Cl. 364-607.000.

Malin, Michael J.: *See*—
Lee, Martin J.; and Malin, Michael J., 4,250,257, Cl. 435-4.000.

Malz Nominees Pty. Ltd.: *See*—
Trihey, John M., 4,249,495, Cl. 123-432.000.

Manley, Martin H.: *See*—
Bloodworth, Greville G.; and Manley, Martin H., 4,250,518, Cl. 357-27.000.

Mantegani, Enzo, to Welko Industriale S.p.A. Kiln. 4,249,895, Cl. 432-128.000.

Marchaj, Tadeusz J., to Preload Technology, Inc. Earthquake resistant tank. 4,249,352, Cl. 52-167.000.

Marconi Company, Limited, The: *See*—
Cooper, David; and Davidson, Philip J., 4,250,469, Cl. 332-1.000.

Maresca, Louis M.: *See*—
Robéson, Lloyd M.; Matzner, Markus; and Maresca, Louis M., 4,250,279, Cl. 525-425.000.

Margolin, George D.; and Vurpillat, Victor V., to Auto Register, Inc. Automatic money handling device. 4,249,552, Cl. 133-1.00R.

Maries, Alan; and Shreeve, Francesca M., to International Standard Electric Corporation. Glass composition for water setting ion-polymer cements. 4,250,277, Cl. 525-337.000.

Marine Electric Corporation: *See*—
Parke, Harry G., 4,250,484, Cl. 340-52.00F.

Mark Products, Inc.: *See*—
McNeel, William O., 4,249,788, Cl. 339-94.00M.

Marquess, Richard D., to Systron-Donner Corporation. Bearing preload assembly for use in an oil filled accelerometer. 4,249,420, Cl. 73-516.00R.

Marra, Paul. Power bowstring release device. 4,249,507, Cl. 124-35.00A.

Martin, Alfred C.: *See*—
Waddington, Alan; and Martin, Alfred C., 4,249,862, Cl. 416-134.00A.

Martin, Edward A.: *See*—
Dorey, Howard A.; Martin, Edward A.; and Spooner, Michael I., 4,250,407, Cl. 307-209.000.

Martin Engineering: *See*—
Stahura, Richard, 4,249,650, Cl. 198-499.000.

Martin, Jerry R.; Tadanier, John S.; Johnson, Paulette; and Nadzan, Alex M., to Abbott Laboratories. 2-Deoxy-2-substituted fortimicin A and B and derivatives. 4,250,304, Cl. 536-17.00R.

Martin, William O.: *See*—
Ko, Wen H.; Fleming, David G.; Derda, Harry J.; and Martin, William O., 4,249,527, Cl. 128-204.180.

Martinez, Marco A. Solar collector. 4,249,519, Cl. 126-450.000.

Martinich, Pamela J.: *See*—
Foscante, Raymond E.; Gysegem, Albert P.; Martinich, Pamela J.; and Law, Gabriel H., 4,250,074, Cl. 260-32.8EP.

Martino, Germain: *See*—
Le Page, Jean-Francois; Martino, Germain; and Miquel, Jean, 4,250,056, Cl. 252-441.000.

Marttinen, Jarmo. Piston type cleaning valve. 4,249,561, Cl. 137-244.000.

Maru, Hansraj C., to Energy Research Corporation. Acid electrolyte fuel cell method having improved carbon corrosion protection. 4,250,231, Cl. 429-13.000.

Marumo, Shingo; and Katayama, Masato, to Noda Institute for Scientific Research. Novel bicyclodecadiene compounds and process for producing them. 4,250,120, Cl. 568-445.000.

Maruyama, Hisaichi: *See*—
Sakaue, Yoshikazu; and Maruyama, Hisaichi, 4,249,704, Cl. 242-7.230.

Maruyama, Shoji: *See*—
Shimada, Masaru; Maruyama, Shoji; and Tamura, Hiroshi, 4,250,240, Cl. 430-66.000.

Maryland Cup Corporation: *See*—
Winstead, Thomas W., 4,250,129, Cl. 264-37.000.

Mase, Akira: *See*—
Iwaki, Katsutaro; Mori, Kazumasa; Mase, Akira; Nimura, Takayasu; Itoh, Katsumi; Akita, Yoshio; Muto, Katsuya; Asahi, Taro; and Banzai, Keiichiro, 4,250,444, Cl. 322-28.000.

Masologites, George P.; Sun, Jui-Yuan; Yoo, Jin S.; and Burk, Emmett H., Jr., to Atlantic Richfield Company. Process for removing sulfur from coal. 4,249,910, Cl. 44-1.0SR.

Masopust, Otto T., Jr.: *See*—
Brown, Donald R.; Masopust, Otto T., Jr.; and Meal, John R., 4,250,534, Cl. 361-272.000.

Massing, Lyle E., to Bendix Corporation, The. Piston and extensible cylinder therefor. 4,249,458, Cl. 92-13.100.

Masubuchi, Sadao, to Citizen Watch Company Limited. Liquid crystal display device. 4,249,801, Cl. 350-346.000.

Masuda, Katsuya; and Saitou, Asao, to Citizen Watch Company Limited. Rotor assembly for stepping motor. 4,250,421, Cl. 310-156.000.

Matheis, Anton: *See*—
Voll, Walter; and Matheis, Anton, 4,249,627, Cl. 180-73.00D.

Mathes, Heinz, to Dragerwerk Aktiengesellschaft. Manual respirator apparatus for use with automatic respirators. 4,249,528, Cl. 128-205.130.

Mathis, Robert D.; and Hine, Gordon, to De Lorean Manufacturing Company. Variable wing plow blade and mounting structure therefor. 4,249,323, Cl. 37-42.00R.

Matlack, Albert S., to Hercules Incorporated. 1-Olefin polymerization catalyst. 4,250,287, Cl. 526-125.000.

Matner, Martin: *See*—
Perrey, Hermann; and Matner, Martin, 4,250,071, Cl. 260-29.7NR.

Matsui, Sadayoshi: *See*—
Takahashi, Nobuo; Shimizu, Masamichi; Hirao, Kazushige; and Matsui, Sadayoshi, 4,250,156, Cl. 423-416.000.

Matsumoto, Junichiro: *See*—
Sugasawa, Fukashi; Iizuka, Haruhiko; Matsumoto, Junichiro; and Etoh, Yukihiro, 4,249,374, Cl. 60-276.000.

Matsumoto, Keiji, to Nippon Electric Co., Ltd. Information processing apparatus capable of effecting parallel processings by using a divided common bus. 4,250,547, Cl. 364-200.000.

Matsumoto, Shuichi: *See*—
Kotani, Teizo; Matsumoto, Shuichi; Igarashi, Katsutoshi; and Suzuki, Kazuo, 4,250,063, Cl. 260-4.00R.

Matsuoka, Hideoki: *See*—
Mizote, Masanori; Yamaki, Kiyoshi; Oka, Takashi; Matsuoka, Hideoki; Nomura, Hiroyuki; and Mogi, Takaaki, 4,250,402, Cl. 235-92.0DN.
Nomura, Hiroyuki; Mogi, Takaaki; Mizote, Masanori; Yamaki, Kiyoshi; Oka, Takashi; and Matsuoka, Hideoki, 4,250,403, Cl. 235-92.0DN.

Matsushita Electronics Corporation: *See*—
Katayama, Mitsumasa; and Suemitsu, Masayasu, 4,249,668, Cl. 220-2.10R.

Matsuya, Kuni: *See*—
Wakabayashi, Osamu; Matsuya, Kuni; Ohta, Hiroki; Jikihara, Tetsuo; and Suzuki, Seiichi, 4,249,934, Cl. 71-92.000.

Mattel, Inc.: *See*—
Crain, Philip W.; Kelley, William J.; and Shoff, Daniel J., 4,249,339, Cl. 46-232.000.

Mattock, Patrick, to United Kingdom Atomic Energy Authority. Purification of Factor VIII. 4,250,008, Cl. 204-180.00R.

Mattox, Ernest M. Exercise apparatus. 4,249,725, Cl. 272-117.000.

Matubara, Kenkichi: *See*—
Ochiai, Michio; Tonooka, Noriaki; and Matubara, Kenkichi, 4,250,193, Cl. 424-358.000.

Matzner, Markus: *See*—
Robeson, Lloyd M.; Matzner, Markus; and Maresca, Louis M., 4,250,279, Cl. 525-425.000.

Maurice, Terrence J.: *See*—
Millar, Donald B.; Murray, Edward D.; and Maurice, Terrence J., 4,250,198, Cl. 426-335.000.

Mavel, Gerard F. G.; Morel, Emile M. J.; and Richert, Gabriel M., to Institut National de Recherche Chimique Appliquee. Process for manufacturing finished and semi-finished products from mixtures of various synthetic resin scrap materials. 4,250,222, Cl. 428-285.000.

May, James A., Jr.: *See*—
Lowery, Kirby, Jr.; Knight, George W.; and May, James A., Jr., 4,250,288, Cl. 526-137.000.

Mayer, Donald K., to Thermo King Corporation. Crankcase oil return for a transport refrigeration system providing both heating and cooling. 4,249,389, Cl. 62-192.000.

Mayer, Morrie M., to General Housewares Corp. Cooking utensil with non-stick cooking surface. 4,250,215, Cl. 428-35.000.

Mayers, Richard R.; Huebner, Steven R.; and Chojnacki, Dennis A., to Midland-Ross Corporation. Internal cooling of heat exchanger tubes. 4,249,893, Cl. 432-49.000.

McCall, John M. Methods of treating psychosis. 4,250,175, Cl. 424-248.510.

McCall, John M., to Upjohn Company, The. Methods of treating psychosis. 4,250,181, Cl. 424-250.000.

McCammon, William W., to Sperry Corporation. Stable synchronous drive system for gyroscope rotor. 4,250,442, Cl. 318-723.000.

McCarroll, John J.: *See*—
Foster, Alan I.; James, Peter G.; McCarroll, John J.; and Tennison, Stephen R., 4,250,057, Cl. 252-447.000.

McCauley, Jerry L., to Structural Instrumentation, Inc. Load cell for on-board weighing systems. 4,249,623, Cl. 177-136.000.

McClaflin, Gifford G., to Conoco, Inc. Method of transporting viscous hydrocarbons. 4,249,554, Cl. 137-13.000.

McConnell, Lorne D., to Electric Power Research Institute, Inc. Current interrupter for fault current limiter and method. 4,250,365, Cl. 200-150.00R.

McDonald, Patrick D.; and Rausch, Carl W., to Waters Associates, Inc. Radial compression of packed beds. 4,250,035, Cl. 210-198.200.

McElroy, Arthur H.: *See*—
LaSpisa, Ronald J.; and McElroy, Arthur H., 4,250,130, Cl. 264-40.700.

McFarlane, Finley E.; and Taylor, Robert B., to Eastman Kodak Company. Thermoplastic polyester molding compositions. 4,250,078, Cl. 260-40.00R.

McGraw-Edison Co.: *See*—
Kristofek, Paul J., 4,250,540, Cl. 362-368.000.

McGuire, Robert C., to Dresser Industries, Inc. Methods and apparatus for removing moisture from air. 4,249,778, Cl. 299-64.000.

McLaughlin, Charles S., deceased; and McLaughlin, Charles S., Jr., executor. Snowplow. 4,249,322, Cl. 37-41.000.

McLaughlin, Charles S., Jr., executor: *See*—
McLaughlin, Charles S., deceased; and McLaughlin, Charles S., Jr., executor, 4,249,322, Cl. 37-41.000.

McMahon, Philip J.; and Yates, Frank S., to Croda Synthetic Chemicals Limited. Process for preparing aralkyl halides. 4,250,340, Cl. 568-639.000.

McNabney, John C., to Wehr Corporation. Air control mechanism having noise suppression means. 4,249,571, Cl. 137-601.000.

McNamee, Gary M.: *See*—
Christenson, Christopher P.; McNamee, Gary M.; and Delaune, Ralph H., 4,249,939, Cl. 75-109.000.

McNaul, William F., to Cubic Corporation. Sidelobe discriminator. 4,250,506, Cl. 343-100.0CS.

McNeel, William O., to Mark Products, Inc. Waterproof multiple wire cable connecting device. 4,249,788, Cl. 339-94.00M.

McNeil Corporation: *See*—
Kotyk, Jeffery M., 4,249,868, Cl. 417-511.000.

McSwain, Edward D. Wall ventilator construction. 4,249,460, Cl. 98-32.000.

McVicker, Gary B., to Exxon Research & Engineering Co. Carbonylation process. 4,250,329, Cl. 560-232.000.

Mead Corporation, The: *See*—
Dressler, John L., 4,250,510, Cl. 346-75.000.

Meal, John R.: *See*—
Brown, Donald R.; Masopust, Otto T., Jr.; and Meal, John R., 4,250,534, Cl. 361-272.000.

Meckling, John H., to Magna Motors Corporation. Processes and apparatuses for preparing permanent magnet stators. 4,250,128, Cl. 264-24.000.

Medtronic GmbH: *See*—
Wieser, Alfred, 4,249,901, Cl. 433-119.000.

Mehren, Herbert, to Daimler-Benz Aktiengesellschaft. Pressure medium brake system for a vehicle. 4,249,780, Cl. 303-115.000.

Meiji Seika Kaisha Ltd.: *See*—
Hosoi, Kaoru; Ikeda, Tadamasa; Nakayoshi, Takemi; and Okada, Akira, 4,250,169, Cl. 424-181.000.

Meisert, Ernst: *See*—
Niederdellmann, Georg; Goyert, Wilhelm; Meisert, Ernst; Eitel, Alfred; Wagner, Hans; and Hespe, Hans, 4,250,292, Cl. 528-44.000.

Melendy, Harold A.; and Hamilton, Harold V., to Barry Wright Corporation. Two stage intensifier. 4,249,380, Cl. 60-562.000.

Mellott, Hayes R. Log debarking apparatus. 4,249,585, Cl. 144-208.00G.

Melvin, Waymon A., Jr.: *See*—
Dudash, Allan A.; Melvin, Waymon A., Jr.; and Vercellotti, Leonard C., 4,250,489, Cl. 340-147.00T.

Mera, Hiroshi: *See*—
Tamura, Yorikazu; Aoki, Akihiro; Mera, Hiroshi; and Shimada, Keizo, 4,250,073, Cl. 260-32.6NA.

Merck & Co., Inc.: *See*—
Bochis, Richard J.; Kulsa, Peter; and Tolman, Richard L., 4,250,174, Cl. 424-248.500.
Carlo, Dennis J.; Hagopian, Arpi; and Kniskern, Peter J., 4,250,265, Cl. 435-272.000.
Grier, Nathaniel; Dybas, Richard A.; and Witzel, Bruce E., 4,250,184, Cl. 424-267.000.

Merkel, Russell D., to Caterpillar Tractor Co. Router bit. 4,249,326, Cl. 37-141.00T.

Merkle, Roland: *See*—
Bruder, Werner; and Merkle, Roland, 4,249,489, Cl. 123-90.160.

Merrbaum, Samuel: *See*—
United States of America, National Aeronautics and Space Administration; Feldstein, Cyril; Lewis, Gilbert W.; Culler, Virgil H.; and Merrbaum, Samuel, 4,249,417, Cl. 73-141.00A.

Merten, Uwe: *See*—
Krukemeier, Richard; Merten, Uwe; and Stahlmann, Willi, 4,249,651, Cl. 198-509.000.

Messerschmitt-Boelkow-Blohm GmbH: *See*—
Pogoda, Dieter, 4,250,219, Cl. 428-212.000.

Metal Closures Group Limited: *See*—
Brownbill, Thomas D., 4,249,362, Cl. 53-490.000.

Mewes, Dieter: *See*—
Goedecke, Ralf; Liebert, Martin; Nischk, Wolfgang; Kurandt, Uwe; and Mewes, Dieter, 4,250,308, Cl. 544-190.000.

Meyer, Hans R.; and Weber, Kurt, to Ciba-Geigy Corporation. Benzofuranyl-benzimidazoles. 4,250,317, Cl. 548-327.000.

Meyer, John A., to Keene Corporation. Token identifying system. 4,249,648, Cl. 194-102.000.

Meyer, Robert B.; Schaefer, Harold W.; and Kronmiller, Richard E., to National Union Electric Corporation. Self-propelled vacuum cleaner. 4,249,281, Cl. 15-340.000.

Mezrich, Reuben S.: *See*—
Vilkomerson, David H. R.; Mezrich, Reuben S.; and Rubin, Carl S., 4,249,539, Cl. 128-660.000.

Michalko, Edward, to UOP Inc. Method of preparing spheroidal alumina particles. 4,250,058, Cl. 252-448.000.

Midland-Ross Corporation: *See*—
Mayers, Richard R.; Huebner, Steven R.; and Chojnacki, Dennis A., 4,249,893, Cl. 432-49.000.
Schultz, Thomas J., 4,249,965, Cl. 148-27.000.

Mijovic, Miroslav V.: *See*—
Baigrie, Brian D.; Bailey, Joseph; Johnston, Linda G.; and Mijovic, Miroslav V., 4,250,238, Cl. 430-17.000.

Mikhailov, Igor V.: *See*—
Mikhailov, Viktor V.; Karakovsky, Alexandr K.; Dyachenko, Petr Y.; Ivanov, Jury S.; Mikhailov, Igor V.; Lunin, Mikhail G.; Buyanov, Alexei V.; Konstantinov, Alexei A.; Shagurin, Anatoly S.; Kirillov, Alexandr P.; Mikhailov, Oleg V.; and Khaimov, Arkady S., 4,249,871, Cl. 425-111.000.

Mikhailov, Oleg V.: *See*—
Mikhailov, Viktor V.; Karakovsky, Alexandr K.; Dyachenko, Petr Y.; Ivanov, Jury S.; Mikhailov, Igor V.; Lunin, Mikhail G.; Buyanov, Alexei V.; Konstantinov, Alexei A.; Shagurin, Anatoly S.; Kirillov, Alexandr P.; Mikhailov, Oleg V.; and Khaimov, Arkady S., 4,249,871, Cl. 425-111.000.

Mikhailov, Viktor V.; Karakovsky, Alexandr K.; Dyachenko, Petr Y.; Ivanov, Jury S.; Mikhailov, Igor V.; Lunin, Mikhail G.; Buyanov, Alexei V.; Konstantinov, Alexei A.; Shagurin, Anatoly S.; Kirillov, Alexandr P.; Mikhailov, Oleg V.; and Khaimov, Arkady S. Plant for producing reinforced-concrete pipes. 4,249,871, Cl. 425-111.000.

Milberger, Ernest C.: *See*—
Shaw, Wilfrid G.; Milberger, Ernest C.; and Dolhyj, Serge R., 4,250,054, Cl. 252-437.000.

Miles, Ronald C.; and Carpenter, Larry D., to Olin Corporation. Process for the preparation of low overvoltage electrodes. 4,250,004, Cl. 204-98.000.

Millar, Donald B.; Murray, Edward D.; and Maurice, Terrence J., to General Foods, Limited. Meat snack analog. 4,250,198, Cl. 426-335.000.

Miller, Blaine M., Jr., to Somat Corporation. Waste pulping apparatus. 4,249,701, Cl. 241-46.170.
Miller, Charles E. Produce stalk cutter. 4,249,702, Cl. 241-205.000.
Miller, Gary K.: *See*—
Kuck, Mark A.; Miller, Gary K.; and Coll-Palagos, Miguel, 4,250,000, Cl. 204-59.0QM.
Miller, John: *See*—
Needham, Brian J.; and Miller, John, 4,250,341, Cl. 568-361.000.
Miller, Kenneth; and Dombeck, Le Roy. Removably anchored box. 4,249,684, Cl. 224-42.400.
Miller, Simon R., Jr.: *See*—
Graboyes, Herman A.; and Miller, Simon R., Jr., 4,249,432, Cl. 76-107.00C.
Millet, Marcus J., to Johnson & Johnson. Hypodermic syringe assembly. 4,249,530, Cl. 128-218.00N.
Mimasu, Kazuo, to Sharp Kabushiki Kaisha. Tracking control for a video disc player. 4,249,746, Cl. 369-221.000.
Mimoun, Hubert, to Institut Francais du Petrole. Catalytic oxidation of alcohols with molecular oxygen to form carbonyl compounds. 4,250,121, Cl. 568-431.000.
Minami, Syuji; Toyota, Akinori; and Kashiwa, Norio, to Mitsui Petrochemical Industries Ltd. Process for polymerizing olefins and catalysts therefor. 4,250,285, Cl. 526-125.000.
Minigrip, Inc.: *See*—
Ausnit, Steven, 4,249,982, Cl. 156-461.000.
Minnesota Mining and Manufacturing Company: *See*—
Nelson, Robert L.; and Drake, James F., 4,250,264, Cl. 435-253.000.
Rueb, John T., 4,249,349, Cl. 51-392.000.
Smith, George H., 4,250,053, Cl. 252-426.000.
Minnick, L. John, to Minnick, L. John. Method for the production of cementitious compositions and aggregate derivatives from said compositions. 4,250,134, Cl. 264-140.000.
Minton, Robert: *See*—
Chang, Zung F.; and Minton, Robert, 4,250,541, Cl. 363-28.000.
Miquel, Jean: *See*—
Le Page, Jean-Francois; Martino, Germain; and Miquel, Jean, 4,250,056, Cl. 252-441.000.
Mita Industrial Company Limited: *See*—
Miyakawa, Nobuhiro; Kokado, Hiroshi; and Inoue, Eiichi, 4,250,250, Cl. 430-374.000.
Mitchell, Douglas A. Thermal reactors. 4,249,472, Cl. 110-245.000.
Mitchell, Francis M.: *See*—
Graham, Thomas E.; Thaxton, George H.; Mitchell, Francis M.; and Bell, Robert P., 4,250,226, Cl. 428-344.000.
Mitchell, Graham: *See*—
Steel, Gordon H.; and Mitchell, Graham, 4,249,415, Cl. 73-120.000.
Mitchell, Richard A.; Nelson, Hoyt H.; and Sherman, Donald R., to Nortron Corporation. Self-calibrating data collection system for dynamic wheel balancing machine. 4,250,555, Cl. 364-571.000.
Mitsubishi Chemical Industries, Limited: *See*—
Wakabayashi, Osamu; Matsuya, Kuni; Ohta, Hiroki; Jikihara, Tetsuo; and Suzuki, Seiichi, 4,249,934, Cl. 71-92.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Oda, Hiroyasu, 4,250,528, Cl. 360-98.000.
Sakaue, Yoshikazu; and Maruyama, Hisaichi, 4,249,704, Cl. 242-7.230.
Tada, Yasuo, 4,249,506, Cl. 123-618.000.
Mitsui Petrochemical Industries Ltd.: *See*—
Minami, Syuji; Toyota, Akinori; and Kashiwa, Norio, 4,250,285, Cl. 526-125.000.
Mittleberg, Mark S.: *See*—
Christenson, Larry E.; Dripps, Rick W.; Gillette, John E.; and Mittleberg, Mark S., 4,249,461, Cl. 98-38.00R.
Mitutoyo Mfg., Co., Ltd.: *See*—
Yoshiike, Katsushi; Igarashi, Toru; and Yamaryo, Yasuyuki, 4,250,381, Cl. 250-237.00G.
Miyakawa, Nobuhiro; Kokado, Hiroshi; and Inoue, Eiichi, to Mita Industrial Company Limited. Photographic process. 4,250,250, Cl. 430-374.000.
Miyake, Katsuyuki: *See*—
Yamada, Koukiti; and Miyake, Katsuyuki, 4,250,450, Cl. 324-169.000.
Miyaki, Takeo: *See*—
Kawaguchi, Hiroshi; Konishi, Masataka; Tsuno, Takashi; and Miyaki, Takeo, 4,250,170, Cl. 424-181.000.
Miyasaka, Kiyoshi: *See*—
Mogi, Junichi; and Miyasaka, Kiyoshi, 4,250,519, Cl. 357-41.000.
Miyashita, Kunio: *See*—
Sento, Hiroshi; Tanabe, Shoji; Shimozu, Tadao; Yamashita, Seiji; and Miyashita, Kunio, 4,250,424, Cl. 310-261.000.
Miyazaki, Yorizo, to Laurel Bank Machine Co., Ltd. Incorrect coin number detector for coin wrapping machine. 4,249,363, Cl. 53-508.000.
Mizote, Masanori; Yamaki, Kiyoshi; Oka, Takashi; Matsuoka, Hideoki; Nomura, Hiroyuki; and Mogi, Takaaki, to Nissan Motor Company, Limited. Electronic trip meter for a motor vehicle. 4,250,402, Cl. 235-92.0DN.
Mizote, Masanori: *See*—
Nomura, Hiroyuki; Mogi, Takaaki; Mizote, Masanori; Yamaki, Kiyoshi; Oka, Takashi; and Matsuoka, Hideoki, 4,250,403, Cl. 235-92.0DN.
Mizuguchi, Mamoru: *See*—
Tsutsumi, Tadashi; and Mizuguchi, Mamoru, 4,250,375, Cl. 219-216.000.
Mobay Chemical Corporation: *See*—
Heiss, Herbert L., 4,250,106, Cl. 260-453.0SP.
Mobil Oil Corporation: *See*—
Chu, Chin-Chiun, 4,250,345, Cl. 585-467.000.
Okorodudu, Abraham O., 4,250,314, Cl. 546-21.000.
Mocquet, Gisele C.: *See*—
Dostert, Philippe L.; Douzon, Colette A.; Bourgery, Guy R.; Gouret, Claude G.; Mocquet, Gisele C.; and Coston, Jean-Alain, 4,250,318, Cl. 548-229.000.
Modrovich, Ivan E. Stabilized liquid enzyme and coenzyme compositions. 4,250,254, Cl. 435-14.000.
Moe, Richard G., to Allis-Chalmers Corporation. Folding implement and folding support therefor. 4,249,616, Cl. 172-311.000.
Moe, Walter; Diker, Charles M.; and Bernstein, Lawrence A. Construction toy. 4,249,336, Cl. 46-17.000.
Moeller, Arnold T., to Leuca, Walter. Heated drafting board. 4,250,396, Cl. 219-218.000.
Moench, Jerry D.; and Tesch, Rodney C., to Motorola, Inc. Speed-up circuit. 4,250,410, Cl. 307-263.000.
Moench, Jerry D.: *See*—
Kung, Roger I.; and Moench, Jerry D., 4,250,412, Cl. 307-279.000.
Mogi, Junichi; and Miyasaka, Kiyoshi, to Fujitsu Limited. Semiconductor devices having VMOS transistors and VMOS dynamic memory cells. 4,250,519, Cl. 357-41.000.
Mogi, Takaaki: *See*—
Mizote, Masanori; Yamaki, Kiyoshi; Oka, Takashi; Matsuoka, Hideoki; Nomura, Hiroyuki; and Mogi, Takaaki, 4,250,402, Cl. 235-92.0DN.
Nomura, Hiroyuki; Mogi, Takaaki; Mizote, Masanori; Yamaki, Kiyoshi; Oka, Takashi; and Matsuoka, Hideoki, 4,250,403, Cl. 235-92.0DN.
Mohammed, M. Hamdi A.; Agarwal, Dwarika P.; and Ingersoll, Clyde E., to Williams Gold Refining Company Incorporated. Non-precious ceramic alloy. 4,249,943, Cl. 75-171.000.
Moirez, Jacques, to Societe d'Optique, Precision Electronique et Mecanique Sopelem. Optical observation instrument with fiber optic image stabilizer. 4,249,792, Cl. 350-16.000.
Molini, Alberto E.; and Zener, Clarence. Method and apparatus for obtaining electrical power from sea water and other liquids. 4,249,383, Cl. 60-641.000.
Molins Limited: *See*—
Hinchcliffe, Dennis, 4,249,849, Cl. 414-404.000.
Moller, Heinz: *See*—
Honig, Gunter; and Moller, Heinz, 4,249,493, Cl. 123-416.000.
Molnar, Arpad: *See*—
Felfoldi, Karoly; Apjok, Jozsef; Bartok, Mihaly; Czombos, Jozsef; Molnar, Arpad; Noteisz, Ferenc; Karpati, Egon; and Szporny, Laszlo, 4,250,310, Cl. 544-379.000.
Monarch Marking Systems, Inc.: *See*—
Hamisch, Paul H., Jr., 4,249,973, Cl. 156-216.000.
Monroe, Carl M.; and Sweet, Randall P., to Dow Corning Corporation. Electrically conductive polydiorganosiloxanes. 4,250,075, Cl. 260-33.6SB.
Monsanto Company: *See*—
Argo, Wesley B.; Kocatas, Babur M.; and Ziebold, S. A., 4,249,918, Cl. 55-97.000.
Burnett, Joseph C., Jr.; and Heckle, William A., 4,250,001, Cl. 204-73.00A.
Grabiak, Raymond C., 4,250,320, Cl. 556-404.000.
Graham, Thomas E.; Thaxton, George H.; Mitchell, Francis M.; and Bell, Robert P., 4,250,226, Cl. 428-344.000.
Lawton, Ernest L., 4,250,275, Cl. 525-128.000.
Phillips, Richard E., Jr., 4,250,065, Cl. 260-18.00N.
Van Eenam, Donald N., 4,250,212, Cl. 427-386.000.
Monson, Anthony E. P.: *See*—
Ashcroft, Richard I.; Kaktovics, David; Monson, Anthony E. P.; and Weeks, David M., 4,250,405, Cl. 235-456.000.
Montag, Bernhard, to Siemens Aktiengesellschaft. Method for developing residual-moisture photographs. 4,250,249, Cl. 430-355.000.
Montedison S.p.A.: *See*—
Costantini, Giuseppe; Serafini, Mauro; and Paoli, Pietro, 4,250,330, Cl. 562-409.000.
Giannini, Umberto; Albizzati, Enrico; and Parodi, Sandro, 4,250,104, Cl. 260-448.0AD.
Mookherjee, Braja D.: *See*—
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,250,194, Cl. 426-3.000.
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Vinals, Joaquin F.; Kiwala, Jacob; and Schmitt, Frederick L., 4,250,201, Cl. 426-538.000.
Trenkle, Robert W.; Mookherjee, Braja D.; Hall, John B.; Kasper, Robin; Vock, Manfred H.; Schreck, Ronald; Granda, Edward J.; and Vinals, Joaquin F., 4,250,332, Cl. 568-347.000.
Wilson, Richard A.; Schreiber, William L.; Mookherjee, Braja D.; Kiwala, Jacob; Vinals, Joaquin F.; Vock, Manfred H.; Stork, Gilbert; and Schmitt, Frederick L., 4,250,049, Cl. 252-174.110.
Morancho, Roland: *See*—
Constant, Georges; Haran, Raymond; Lebugle, Albert; Zaouk, Aref; Morancho, Roland; and Pouvreau, Philippe, 4,250,205, Cl. 427-87.000.
Morel, Emile M. J.: *See*—
Mavel, Gerard F. G.; Morel, Emile M. J.; and Richert, Gabriel M., 4,250,222, Cl. 428-285.000.
Mori, Kazumasa: *See*—
Iwaki, Katsutaro; Mori, Kazumasa; Mase, Akira; Nimura, Takayasu; Itoh, Katsumi; Akita, Yoshio; Muto, Katsuya; Asahi, Taro; and Banzai, Keiichiro, 4,250,444, Cl. 322-28.000.

Morrell, Roger J.; Larson, William C.; and Schmidt, Robert D., to United States of America, Interior. Method of in situ mining. 4,249,777, Cl. 299-4.000.

Morris, Henry B.: *See—*
Bate, Robert T.; and Morris, Henry B., 4,250,206, Cl. 427-88.000.

Morris, Jeff; Brandli, Jacqueline; Lanza, Emmanuel; and Lingier, Willy F. R., to Cosden Technology, Inc. ABS-Type polyblend compositions. 4,250,271, Cl. 525-66.000.

Morton, John; and Stevens, Keith D., to Cableform Limited. Field weakening circuits for electric motors. 4,250,437, Cl. 318-357.000.

Morwood, Burton S. Gun sling. 4,249,686, Cl. 224-150.000.

Moskovich, Jacob, to Vivitar Corporation. Miniature camera with zoom lens. 4,249,798, Cl. 350-423.000.

Mosolov, Nikolai K.: *See—*
Talyzin, Nikolai V.; Rozengauz, Solomon M.; Tikhonov, Vasily F.; and Mosolov, Nikolai K., 4,250,028, Cl. 209-583.000.

Mostert, Jacob J.; and Henderson, Henning M., to Kiloking (Proprietary) Limited. Monitoring the operation of a vehicle. 4,250,485, Cl. 340-52.00R.

Motegi, Shoji: *See—*
Tahara, Kazuo; Tagima, Fumio; Motegi, Shoji; and Saito, Shigeki, 4,250,422, Cl. 310-227.000.

Motobayashi, Kozo: *See—*
Tsuzuki, Kanemitsu; Motobayashi, Kozo; Watanabe, Kazuo; Kito, Yastami; and Seko, Shigeo, 4,249,369, Cl. 57-263.000.

Motorola, Inc.: *See—*
Alaspa, Allan A., 4,250,406, Cl. 307-205.000.
Boney, Joel F.; Musa, Fuad H.; and Ritter, Terry F., 4,250,546, Cl. 364-200.000.
Cota, Marlo E.; and Gurtler, Richard W., 4,250,148, Cl. 422-246.000.
Gray, Randall C.; and Pace, W. David, 4,250,452, Cl. 328-1.000.
Iwer, Herbert W.; and Cochran, Johnnie J., 4,250,462, Cl. 330-296.000.
Kung, Roger I.; and Moench, Jerry D., 4,250,412, Cl. 307-279.000.
Moench, Jerry D.; and Tesch, Rodney C., 4,250,410, Cl. 307-263.000.

Mott, Walter W.: *See—*
Schnall, Ira H.; and Mott, Walter W., 4,249,574, Cl. 137-625.300.

Moyers, Clyde V.: *See—*
Bryan, Coleman J.; Wright, Edward E., Jr.; and Moyers, Clyde V., 4,250,143, Cl. 422-109.000.

Muchel, Franz; and Summerer, Gunther, to Carl Zeiss-Stiftung. Ophthalmological instrument. 4,249,802, Cl. 351-7.000.

Mues, Volker; and Behrenz, Wolfgang, to Bayer Aktiengesellschaft. 4,5-Dichloro-3-organo-1,2-methylenedioxy-benzene arthropodicide synergizing agents. 4,250,187, Cl. 424-282.000.

Mukohyama, Hideaki: *See—*
Saito, Motoyasu; and Mukohyama, Hideaki, 4,250,305, Cl. 536-84.000.

Muldrow, Louis M., Jr. Apparatus for breaking scar tissue within a human body. 4,249,534, Cl. 128-319.000.

Muller, Friedhelm: *See—*
Lehmann, Wolfgang; Muller, Friedhelm; Lobach, Wilfried; Cramm, Gunther; and Hammerstrom, Knut, 4,250,298, Cl. 528-342.000.
Lehmann, Wolfgang; Muller, Friedhelm; Cramm, Gunther; Hammerstrom, Knut; and Lobach, Wilfried, 4,250,299, Cl. 528-342.000.
Lobach, Wilfried; Lehmann, Wolfgang; and Muller, Friedhelm, 4,250,112, Cl. 564-291.000.

Muller, Werner H.; Mack, Karl E.; and Hey, Hansjorg, to Hoechst Aktiengesellschaft. Process for the manufacture of resorcinols from δ-ketocarboxylic acid esters. 4,250,336, Cl. 568-772.000.

Murakami, Hiroyasu: *See—*
Suzuki, Masayuki; Ito, Tadashi; Yamamichi, Masayoshi; and Murakami, Hiroyasu, 4,249,816, Cl. 354-266.000.

Muraki, Shigeru: *See—*
Takahashi, Katsuhiro; Muraki, Shigeru; and Yoshida, Toshio, 4,250,117, Cl. 568-377.000.

Murata, Bunjiro: *See—*
Ito, Katsuo; Murata, Bunjiro; and Yoshimura, Kazunori, 4,249,790, Cl. 339-177.00E.

Murata Manufacturing Co., Ltd.: *See—*
Ito, Katsuo; Murata, Bunjiro; and Yoshimura, Kazunori, 4,249,790, Cl. 339-177.00E.

Murata, Masami, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece. 4,250,523, Cl. 368-82.000.

Muray, Julius J.: *See—*
Wiederrich, James L.; Chang, Andrew K.; and Muray, Julius J., 4,249,824, Cl. 356-155.000.

Murdock, James D. Solar drying apparatus and process for drying materials therewith. 4,249,317, Cl. 34-93.000.

Murphy, Richard F., to Holland Company. Rigidifying arrangement for self lubricating yoke wear plate assemblies. 4,249,664, Cl. 213-61.000.

Murray, Edward D.: *See—*
Millar, Donald B.; Murray, Edward D.; and Maurice, Terrence J., 4,250,198, Cl. 426-335.000.

Murray, Michael F.: *See—*
Patureau, Myles A.; and Murray, Michael F., 4,249,655, Cl. 209-31.000.

Musa, Fuad H.: *See—*
Boney, Joel F.; Musa, Fuad H.; and Ritter, Terry F., 4,250,546, Cl. 364-200.000.

Musha, Toshimitsu; Harumi, Kenichi; Teramachi, Yasuaki; and Kanou, Toshiyuki, to Musha, Toshimitsu; and Harumi, Kenichi. Electronic clinic apparatus. 4,249,538, Cl. 128-630.000.

Musiiko, Vitaly A.: *See—*
Kalmykov, Vladimir N.; Musiiko, Vitaly A.; Khlopkov, Leonid P.; Gashenko, Stanislav I.; Rogatkin, Alexandr A.; Silakov, Grigory I.; Shipilov, Viktor F., deceased; Skibina, Elena S., administrator; Shipilov, Gennady V., administrator; and Shipilov, Fedor D., administrator, 4,249,989, Cl. 159-10.000.

Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., to International Flavors & Fragrances Inc. Flavoring with geranyl butyl ether. 4,250,194, Cl. 426-3.000.

Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Vinals, Joaquin F.; Kiwala, Jacob; and Schmitt, Frederick L., to International Flavors & Fragrances Inc. Use of mixture containing caryophyllene alcohols for augmenting or enhancing the aroma or taste of foodstuffs. 4,250,201, Cl. 426-538.000.

Mustang Services Company: *See—*
Lindsey, David L., 4,249,475, Cl. 118-105.000.

Muth, Myron C.: *See—*
Grondahl, Clayton M.; Willmott, Leo C.; and Muth, Myron C., 4,249,291, Cl. 29-156.80H.

Muto, Katsuya: *See—*
Iwaki, Katsutaro; Mori, Kazumasa; Mase, Akira; Nimura, Takayasu; Itoh, Katsumi; Akita, Yoshio; Muto, Katsuya; Asahi, Taro; and Banzai, Keiichiro, 4,250,444, Cl. 322-28.000.

Mutrux, Claude, to Ebauches Electroniques SA. Electronic timepiece in which an input terminal of the integrated circuit is used as an output terminal. 4,250,574, Cl. 368-184.000.

Mutton, Jon C., to Tektronix, Inc. Photoelectric joystick. 4,250,378, Cl. 250-221.000.

Mutzenberg, Arnold B.; and Hausheer, Hans P. Needled fiber mat containing granular agent. 4,250,172, Cl. 428-234.000.

Myers, Marcus N.: *See—*
Giddings, John C.; and Myers, Marcus N., 4,250,026, Cl. 209-155.000.

Nadzan, Alex M.: *See—*
Martin, Jerry R.; Tadanier, John S.; Johnson, Paulette; and Nadzan, Alex M., 4,250,304, Cl. 536-17.00R.

Nagahama, Katsuyasu: *See—*
Uchikuga, Saburo; Itoh, Michiro; and Nagahama, Katsuyasu, 4,250,109, Cl. 564-104.000.

Nagai, Minoru: *See—*
Nakajima, Koichi; Ishiguro, Tomoji; Okamoto, Tokuhiko; Konaka, Minoru; Nagai, Minoru; Higuchi, Kanji; and Sasaki, Kenji, 4,250,426, Cl. 313-143.000.

Nagai, Tsuneji; Machida. Yoshiharu; Suzuki, Yoshiki; and Ikura, Hiroshi, to Teijin Limited. Method and preparation for administration to the mucosa of the oral or nasal cavity. 4,250,163, Cl. 424-14.000.

Nagamune, Yasushi: *See—*
Akaura, Seishiro; Nagamune, Yasushi; and Nakamura, Takeshi, 4,249,872, Cl. 425-111.000.

Nagaoka, Tadahiko: *See—*
Katoh, Masayoshi; Ishii, Takashi; and Nagaoka, Tadahiko, 4,249,673, Cl. 222-3.000.

Nagy, Mary J. Heel protector. 4,249,321, Cl. 36-72.00B.

Naito, Nagayoshi: *See—*
Tanaka, Chiaki; Naito, Nagayoshi; and Furuta, Yoko, 4,250,280, Cl. 525-437.000.

Nakahara, Yutaka; Kubota, Naohiro; and Shibata, Toshihiro, to Argus Chemical Corp. Process for preparing 4-piperidone spiroketal compounds. 4,250,312, Cl. 546-19.000.

Nakahara, Yutaka; Kubota, Naohiro; and Shibata, Toshihiro, to Argus Chemical Corp. Process for preparing 4-piperidone spiroketal compounds. 4,250,313, Cl. 546-19.000.

Nakajima, Koichi; Ishiguro, Tomoji; Okamoto, Tokuhiko; Konaka, Minoru; Nagai, Minoru; Higuchi, Kanji; and Sasaki, Kenji, to Kabushiki Kaisha Toyota Chuo Kenkyusho and Nippondenso Co., Ltd. Spark plug having vanadium oxide islands on central insulator. 4,250,426, Cl. 313-143.000.

Nakamura, Takeshi: *See—*
Akaura, Seishiro; Nagamune, Yasushi; and Nakamura, Takeshi, 4,249,872, Cl. 425-111.000.

Nakano, Moto'o: *See—*
Sasaki, Nobuo; Nakano, Moto'o; Kobayashi, Yasuo; and Iwai, Takashi, 4,250,569, Cl. 365-185.000.

Nakano, Tsunetomo: *See—*
Yasuno, Hiroshi; Yoshinaga, Toshimune; and Nakano, Tsunetomo, 4,250,007, Cl. 204-159.230.

Nakayoshi, Takemi: *See—*
Hosoi, Kaoru; Ikeda, Tadamasa; Nakayoshi, Takemi; and Okada, Akira, 4,250,169, Cl. 424-181.000.

Nalco Chemical Company: *See—*
Seale, Virgil L.; and Goretta, Louis A., 4,250,111, Cl. 564-129.000.

Naphtali, Leonard M.: *See—*
Yang, Ralph T.; Smol, Robert; Farber, Gerald; and Naphtali, Leonard M., 4,250,015, Cl. 208-10.000.

Nathasingh, Davidson M.: *See—*
DeCristofaro, Nicholas J.; Freilich, Alfred; and Nathasingh, Davidson M., 4,249,969, Cl. 148-108.000.

National Research Development Corporation: *See—*
Shanks, Ian A., 4,250,503, Cl. 340-754.000.

National Union Electric Corporation: *See*—
Meyer, Robert B.; Schaefer, Harold W.; and Kronmiller, Richard E., 4,249,281, Cl. 15-340.000.

Natmar, Inc.: *See*—
Clay, Bobby J., 4,249,436, Cl. 83-22.000.

Navez, Jean-Pierre: *See*—
Baes, Emile; Navez, Jean-Pierre; and Della Faille de Leverghem, Marc, 4,249,991, Cl. 162-152.000.

NCR Corporation: *See*—
Crepeau, Philip C., 4,249,302, Cl. 29-830.000.

Needham, Brian J.; and Miller, John, to Fisons Limited. 2,2,6,6-Tetrachloro (or bromo) cyclohexane and pyrogallol. 4,250,341, Cl. 568-361.000.

Neister, S. Edward. Dye laser flashlamp and method of making same. 4,250,427, Cl. 313-217.000.

Nelson, Avi N. Security system. 4,250,533, Cl. 361-172.000.

Nelson, George F.: *See*—
Cosimini, Gregory J.; Johnson, Leslie H.; Lo, David S.; Nelson, George F.; and Paul, Maynard C., 4,250,565, Cl. 365-87.000.

Nelson, Hoyt H.: *See*—
Mitchell, Richard A.; Nelson, Hoyt H.; and Sherman, Donald R., 4,250,555, Cl. 364-571.000.

Nelson, Robert L.; and Drake, James F., to Minnesota Mining and Manufacturing Company. Growth limiting media. 4,250,264, Cl. 435-253.000.

Nemaud, Yves: *See*—
de Panafieu, Arnaud; Baylac, Christiane; Nemaud, Yves; Turpin, Marc; and Faure, Michel, 4,249,924, Cl. 65-2.000.

Nemeth, Bela J.: *See*—
Grab, George P.; Hood, Grant W., Jr.; Swanson, Sigurd A.; and Nemeth, Bela J., 4,249,955, Cl. 106-308.00Q.

Nestor, Jack; Ciment, Lawrence M.; and Rotbart, Abraham. Snap-action holder for endotracheal tube with one-way quick tightening head bands. 4,249,529, Cl. 128-207.170.

Neubuser, Siegmar: *See*—
Lampe, Siegfried; and Neubuser, Siegmar, 4,249,844, Cl. 414-45.000.

Nevalainen, Harri. High strength steel for diffusion chromizing. 4,249,961, Cl. 148-14.000.

Newitzki, Berthold, to Erich Ruhl Chemische Fabrik und Chemikalien-Grosshandel, Firma. Plastics material and method of producing said material. 4,250,224, Cl. 428-310.000.

Newsom, Charles F., to Newsom, Charles Fred. Apparatus and method of monitoring automatic safety control switches of electrical apparatus. 4,250,480, Cl. 337-6.000.

Newsom, Charles Fred: *See*—
Newsom, Charles F., 4,250,480, Cl. 337-6.000.

Ng, Gim S., to United States of America, Army. Gun sight. 4,249,332, Cl. 42-1.00S.

Nicholson, James. Apparatus for irradiating a surface. 4,250,390, Cl. 250-504.00R.

Nickell, Louis G.: *See*—
Karabinos, Joseph V.; and Nickell, Louis G., 4,250,319, Cl. 549-61.000.

Niederdellmann, Georg; Goyert, Wilhelm; Meisert, Ernst; Eitel, Alfred; Wagner, Hans; and Hespe, Hans, to Bayer Aktiengesellschaft. Process for the preparation of polyurethane elastomers in which at least two reactant portions are introduced into separate positions of a screw machine. 4,250,292, Cl. 528-44.000.

Nielinger, Werner; Brassat, Bert; and Vernaleken, Hugo, to Bayer Aktiengesellschaft. Transparent copolyamide from isophthalic acid reactant. 4,250,297, Cl. 528-340.000.

Nieman, Merle D.: *See*—
Hubbard, Arthur L.; Copley, Russell D.; and Nieman, Merle D., 4,249,365, Cl. 56-13.200.

Nihei, Takahiro, to Olympus Optical Co., Ltd. Fixture for electronic flash. 4,249,813, Cl. 354-128.000.

Nikiforov, Vladimir P.: *See*—
Kaluzhsky, Nikolai A.; Gefter, Semen E.; Tsybukov, Igor K.; Evdokimov, Svetozar V.; Derkach, Alexei S.; Tsyplakov, Anatoly M.; Lankin, Valery P.; Velichko, Boris P.; Kostin, Albert A.; Volfson, Grigory E.; and Nikiforov, Vladimir P., 4,250,012, Cl. 204-243.00M.

Nikitin, Jury I.: *See*—
Bura, Svetlana T.; and Nikitin, Jury I., 4,249,347, Cl. 51-298.000.

Nikko Industry Co., Ltd.: *See*—
Udo, Eiji, 4,249,721, Cl. 266-156.000.

Nilson, Billy N., to KeNova AB. Device for dispensing fluid from a container. 4,249,675, Cl. 222-207.000.

Nilsson, Lars K., to Telefonaktiebolaget L M Ericsson. Narrow band level detector for detecting a periodic signal. 4,250,453, Cl. 328-138.000.

Nimura, Takayasu: *See*—
Iwaki, Katsutaro; Mori, Kazumasa; Mase, Akira; Nimura, Takayasu; Itoh, Katsumi; Akita, Yoshio; Muto, Katsuya; Asahi, Taro; and Banzai, Keiichiro, 4,250,444, Cl. 322-28.000.

Nippon Electric Co., Ltd.: *See*—
Matsumoto, Keiji, 4,250,547, Cl. 364-200.000.
Shinmyo, Saburo; and Tan, Yoichi, 4,250,456, Cl. 329-50.000.
Takahashi, Kousuke, 4,250,564, Cl. 365-6.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Iyeta, Motoi, 4,250,380, Cl. 250-231.0SE.
Tomisawa, Norio, 4,249,447, Cl. 84-1.010.

Nippon Kogaku K.K.: *See*—
Uehara, Makoto, 4,249,793, Cl. 350-43.000.

Nippon Seiko Kabushiki Kaisha: *See*—
Asano, Shuichi, 4,249,708, Cl. 242-107.200.

Nippon Soda Company, Ltd.: *See*—
Iwataki, Isao; Shibuya, Masami; Ishikawa, Hisao; and Kawana, Takashi, 4,249,937, Cl. 71-97.000.

Nippon Soken, Inc.: *See*—
Shimazaki, Ryuji; and Satoh, Yoji, 4,249,496, Cl. 123-438.000.

Nippon Steel Corporation: *See*—
Takahashi, Hisashi; Hanai, Satoshi; and Yoshida, Katsuyoshi, 4,250,207, Cl. 427-211.000.

Nippon Tungsten Co., Ltd.: *See*—
Ogawa, Kazuki; Furukawa, Mitsuhiko; Hara, Yoshimichi; and Kitahira, Takashi, 4,249,914, Cl. 51-309.000.

Nippondenso Co., Ltd.: *See*—
Iwaki, Katsutaro; Mori, Kazumasa; Mase, Akira; Nimura, Takayasu; Itoh, Katsumi; Akita, Yoshio; Muto, Katsuya; Asahi, Taro; and Banzai, Keiichiro, 4,250,444, Cl. 322-28.000.
Yamada, Koukiti; and Miyake, Katsuyuki, 4,250,450, Cl. 324-169.000.

Nischk, Wolfgang: *See*—
Goedecke, Ralf; Liebert, Martin; Nischk, Wolfgang; Kurandt, Uwe; and Mewes, Dieter, 4,250,308, Cl. 544-190.000.

Nischwitz, Ehrenfried: *See*—
Lask, Helmut; Holst, Arno; Nischwitz, Ehrenfried; and Sommer, Hans, 4,250,306, Cl. 536-88.000.

Nishikido, Joji; Tamura, Nobuhiro; Fukuoka, Yohei; and Yamane, Hiroyuki, to Asahi Kasei Kogyo Kabushiki Kaisha. Method of preparing metoclopramide. 4,250,110, Cl. 564-156.000.

Nishimura, Hiroyuki, to Honda Giken Kogyo Kabushiki Kaisha. Compensation system for quantity of intake air for an internal combustion engine. 4,249,505, Cl. 123-587.000.

Nishimura, Hiroyuki: *See*—
Noguchi, Takeshi; Nishimura, Hiroyuki; and Umemoto, Takashi, 4,249,503, Cl. 123-568.000.
Shioya, Toshio; Ishii, Kiyoshi; and Nishimura, Hiroyuki, 4,249,490, Cl. 123-568.000.
Shioya, Toshio; Ishii, Kiyoshi; and Nishimura, Hiroyuki, 4,249,504, Cl. 123-568.000.

Nishimura, Tamotsu, to Futaba Kinzoku Kogyo Kabushiki Kaisha. Locking assembly for doors and the like of a box body. 4,249,761, Cl. 292-251.500.

Nissan Motor Company, Limited: *See*—
Fujii, Toshihiko, 4,249,983, Cl. 156-475.000.
Katoh, Masayoshi; Ishii, Takashi; and Nagaoka, Tadahiko, 4,249,673, Cl. 222-3.000.
Mizote, Masanori; Yamaki, Kiyoshi; Oka, Takashi; Matsuoka, Hideoki; Nomura, Hiroyuki; and Mogi, Takaaki, 4,250,402, Cl. 235-92.0DN.
Nomura, Hiroyuki; Mogi, Takaaki; Mizote, Masanori; Yamaki, Kiyoshi; Oka, Takashi; and Matsuoka, Hideoki, 4,250,403, Cl. 235-92.0DN.
Sugasawa, Fukashi; Iizuka, Haruhiko; Matsumoto, Junichiro; and Etoh, Yukihiro, 4,249,374, Cl. 60-276.000.

Noda Institute for Scientific Research: *See*—
Marumo, Shingo; and Katayama, Masato, 4,250,120, Cl. 568-445.000.

Noguchi, Takeshi; Nishimura, Hiroyuki; and Umemoto, Takashi, to Honda Giken Kogyo Kabushiki Kaisha. Exhaust gas recirculation for engine. 4,249,503, Cl. 123-568.000.

Nomura, Hiroyuki; Mogi, Takaaki; Mizote, Masanori; Yamaki, Kiyoshi; Oka, Takashi; and Matsuoka, Hideoki, to Nissan Motor Company, Limited. Electronic trip meter with a correction circuit for an automotive vehicle. 4,250,403, Cl. 235-92.0DN.

Nomura, Hiroyuki: *See*—
Mizote, Masanori; Yamaki, Kiyoshi; Oka, Takashi; Matsuoka, Hideoki; Nomura, Hiroyuki; and Mogi, Takaaki, 4,250,402, Cl. 235-92.0DN.

Nordal, Vegard; and Holtermann, Hugo, to Nyegaard & Co. A/S. Chemical compounds. 4,250,113, Cl. 564-153.000.

Nordsiek, Karl-Heinz: *See*—
Sommer, Neithart; Nordsiek, Karl-Heinz; and Ehrlich, Jurgen, 4,250,082, Cl. 260-42.550.

Nordstrom, Stuart S. Fingernail kit. 4,249,551, Cl. 132-73.000.

Norris, Gilbert H. Constant torque rotary engine. 4,249,492, Cl. 123-234.000.

North American Utility Construction Corp.: *See*—
Stark, Virgil, 4,249,516, Cl. 126-439.000.

Northern Telecom Limited: *See*—
Barth, Leonard A., 4,249,414, Cl. 73-81.000.
Lougheed, James H.; and Hinz, Lorne C., 4,249,630, Cl. 180-168.000.

Nortron Corporation: *See*—
Mitchell, Richard A.; Nelson, Hoyt H.; and Sherman, Donald R., 4,250,555, Cl. 364-571.000.

Nose, Masahiko: *See*—
Kimura, Morihiro; Yamamoto, Kenji; and Nose, Masahiko, 4,249,680, Cl. 222-598.000.

Noso, Shizuma, to Toyo Kogyo Co., Ltd. Moulding clip devices for adhesively attached windshield structures. 4,249,356, Cl. 52-717.000.

Noteisz, Ferenc: *See*—
Felfoldi, Karoly; Apjok, Jozsef; Bartok, Mihaly; Czombos, Jozsef; Molnar, Arpad; Noteisz, Ferenc; Karpati, Egon; and Szporny, Laszlo, 4,250,310, Cl. 544-379.000.

Novak, Frank: *See*—
Anderson, Earl R.; and Johnson, Lee E., 4,249,355, Cl. 52-593.000.

Novus Inc.: *See*—
Petersen, Paul S., 4,249,869, Cl. 425-13.000.
Noyes, Ronald T.; and Williams, Eugene E., to Beard Industries, Inc. Advanced optimum continuous crossflow grain drying and conditioning method and apparatus. 4,249,891, Cl. 432-14.000.
Nyegaard & Co. A/S: *See*—
Nordal, Vegard; and Holtermann, Hugo, 4,250,113, Cl. 564-153.000.
Obeda, Edward G., to Branson Ultrasonics Corporation. High frequency horn with soft metallic coating. 4,249,986, Cl. 156-580.100.
Oberstein, Karla: *See*—
Schreyer, Karlheinz; and Oberstein, Karla, 4,250,353, Cl. 179-5.00R.
Occidental Oil Shale, Inc.: *See*—
Burton, Robert S., III; and Chambers, Carlon C., 4,249,602, Cl. 166-251.000.
Skogen, Haven S., 4,249,603, Cl. 166-251.000.
Ochiai, Michio; Tonooka, Noriaki; and Matubara, Kenkichi, to Pola Chemical Industries, Inc. Cosmetics. 4,250,193, Cl. 424-358.000.
O'Connor, Donald T.; Lorenzi, Donald E.; Flaherty, John J.; and Schaefer, Edward, to Magnaflux Corporation. Pipeline inspection apparatus. 4,249,810, Cl. 354-63.000.
O'Connor, John J., to Akzona Incorporated. Apparatus for determining immunochemical substances. 4,250,394, Cl. 250-574.000.
Oda, Hiroyasu, to Mitsubishi Denki Kabushiki Kaisha. Magnetic disc recording apparatus. 4,250,528, Cl. 360-98.000.
Odenwalder, Heinrich; Vetter, Hans; Puschel, Walter; and Ranz, Erwin, to AGFA-Gevaert, A.G. Light-sensitive color photographic material. 4,250,252, Cl. 430-505.000.
Odermann, Charles R.: *See*—
Herron, William L.; and Odermann, Charles R., 4,249,428, Cl. 74-569.000.
Odev S.A.: *See*—
Chevallier, Rene G., 4,249,573, Cl. 137-624.200.
Oellerer, Friedrich: *See*—
Theurer, Josef; and Oellerer, Friedrich, 4,249,467, Cl. 104-3.000.
Office National d'Etudes et de Recherches Aerospatiales: *See*—
Bernard, Claude R.; Daigne, Bernard; and Girard, Francois, 4,250,433, Cl. 315-335.000.
Ogawa, Kazuki; Furukawa, Mitsuhiko; Hara, Yoshimichi; and Kitahira, Takashi, to Nippon Tungsten Co., Ltd. Cutting tool material and method for producing cutting tool material. 4,249,914, Cl. 51-309.000.
Ogura, Kiyoshi. Case for a tape. 4,249,658, Cl. 206-409.000.
Ohmori, Akira: *See*—
Suzuki, Takeshi; Furukawa, Yasuyoshi; Tomoda, Masayasu; Ueta, Yutaka; and Ohmori, Akira, 4,250,278, Cl. 525-340.000.
Ohta, Hiroki: *See*—
Wakabayashi, Osamu; Matsuya, Kuni; Ohta, Hiroki; Jikihara, Tetsuo; and Suzuki, Seiichi, 4,249,934, Cl. 71-92.000.
Oka, Takashi: *See*—
Mizote, Masanori; Yamaki, Kiyoshi; Oka, Takashi; Matsuoka, Hideoki; Nomura, Hiroyuki; and Mogi, Takaaki, 4,250,402, Cl. 235-92.0DN.
Nomura, Hiroyuki; Mogi, Takaaki; Mizote, Masanori; Yamaki, Kiyoshi; Oka, Takashi; and Matsuoka, Hideoki, 4,250,403, Cl. 235-92.0DN.
Okabe, Moisei: *See*—
Kanamaru, Hisanobu; Tatsumi, Hideo; Okabe, Moisei; and Tohkairin, Akira, 4,249,298, Cl. 29-520.000.
Okada, Akira: *See*—
Hosoi, Kaoru; Ikeda, Tadamasa; Nakayoshi, Takemi; and Okada, Akira, 4,250,169, Cl. 424-181.000.
Okada, Eisaburo; and Sakagami, Koji, to Kao Soap Co., Ltd. Additive for air-entrained concrete or air-entrained mortar. 4,249,948, Cl. 106-88.000.
Okada, Hisanao: *See*—
Kawashima, Masao; Okada, Hisanao; and Kikuchi, Bun, 4,249,925, Cl. 65-3.00A.
Okamoto, Tokuhiko: *See*—
Nakajima, Koichi; Ishiguro, Tomoji; Okamoto, Tokuhiko; Konaka, Minoru; Nagai, Minoru; Higuchi, Kanji; and Sasaki, Kenji, 4,250,426, Cl. 313-143.000.
Oki Electric Industry Co., Ltd.: *See*—
Onoda, Fumio, 4,250,438, Cl. 318-561.000.
Okita, Koichi, to Sumitomo Electric Industries, Ltd. Process for producing microporous tubes of polytetrafluoroethylene. 4,250,138, Cl. 264-568.000.
Okorodudu, Abraham O., to Mobil Oil Corporation. Adducts of phosphorous triamides and α, β unsaturated carbonyl compounds. 4,250,314, Cl. 546-21.000.
Olin Corporation: *See*—
Miles, Ronald C.; and Carpenter, Larry D., 4,250,004, Cl. 204-98.000.
Shapiro, Eugene; Vitek, John M.; and Smith, Warren F., Jr., 4,249,942, Cl. 75-157.500.
Oliver, David W.; and Trzaskos, Casmir R., to United States of America, Army. Bonded cathode and electrode structure with layered insulation, and method of manufacture. 4,250,428, Cl. 313-268.000.
Olschewski, Armin; Kunkel, Heinrich; Brandenstein, Manfred; and Walter, Lothar, to SKF Kugellagerfabriken GmbH. Rotary drilling bit with conically shaped rotary cutters. 4,249,781, Cl. 308-8.200.
Olsen, Frederick C.: *See*—
Crago, Terril M.; and Olsen, Frederick C., 4,249,410, Cl. 72-347.000.
Olson, Erlvada A.: *See*—
Hounsfield, Godfrey N.; Waltham, Richard M.; Pisano, Daniel J., Jr.; and Olson, Erlvada A., 4,250,387, Cl. 250-445.00T.
Olympus Optical Co., Ltd.: *See*—
Komiya, Osamu, 4,249,533, Cl. 128-303.100.
Nihei, Takahiro, 4,249,813, Cl. 354-128.000.
Onda, Hirotsugu, to Onda Ironworks Company, Ltd. Carpenter planer. 4,249,584, Cl. 144-120.000.
Onda Ironworks Company, Ltd.: *See*—
Onda, Hirotsugu, 4,249,584, Cl. 144-120.000.
Onoda, Fumio, to Oki Electric Industry Co., Ltd. Digitally controlled acceleration and deceleration system. 4,250,438, Cl. 318-561.000.
Oppl, Othmar; and Jaeger, Hermann-Siegfried, to Admiral Maschinenfabrik GmbH. Station for running foam-plastics material into shut molds. 4,249,881, Cl. 425-543.000.
Opprecht, Paul; and Frei, Siegfried. Apparatus for applying a protective coating to the welded seam of a can body or the like. 4,249,476, Cl. 118-204.000.
Oreck Corp.: *See*—
Goodrich, Gordon W., 4,249,280, Cl. 15-323.000.
Orillion, Alfred G. Pyramidal energy collector system. 4,249,520, Cl. 126-439.000.
O'Rourke, Thomas J.: *See*—
Sprecker, Mark A.; Sanders, James M.; Schreiber, William L.; Watkins, Hugh; Vinals, Joaquin F.; Shuster, Edward J.; O'Rourke, Thomas J.; Hagedorn, Myrna L.; and Klemarczyk, Philip, 4,250,338, Cl. 568-343.000.
Orsa Kattingfabrik AB: *See*—
Kallaes, Elis; and Starell, Karl-Erik, 4,249,840, Cl. 410-81.000.
Orsini, Peter C. Roller for producing continuous sueded or grit type finish and method of making. 4,250,135, Cl. 264-227.000.
Ortho Pharmaceutical Corporation: *See*—
Heavner, George, 4,250,086, Cl. 260-112.50R.
Kane, Vinayak V.; and Levine, Seymour D., 4,250,180, Cl. 424-250.000.
Osawa Press Mfg. Co., Ltd.: *See*—
Hara, Akinori, 4,249,433, Cl. 81-9.510.
Osborn, Harland J.; Cameron, Robert G.; and Walsh, Edward J., to Eastman Kodak Company. Phenylsulfamoyl couplers, coupler compositions and photographic elements suited to forming integral sound tracks. 4,250,251, Cl. 430-449.000.
Otisca Industries, Ltd.: *See*—
Smith, Clay D.; and Keller, Douglas V., Jr., 4,249,699, Cl. 241-20.000.
Otteson, Kenneth M.: *See*—
Dawson, Daniel J.; Otteson, Kenneth M.; and Davis, Roman, 4,250,327, Cl. 560-169.000.
Otzen, Uwe; and Gruner, Peter, to Hugo, Kern & Liebers & Company. Mechanism for the automatic spooling of safety belts. 4,249,709, Cl. 242-107.300.
Owen, Calvin P.: *See*—
Cheney, Roland J.; and Owen, Calvin P., 4,249,740, Cl. 273-260.000.
Owens-Corning Fiberglas Corporation: *See*—
Greene, Neil E.; and Srinivasan, Seshadri, 4,249,398, Cl. 65-1.000.
Owens, Roger W.: *See*—
Hickey, Robert F.; and Owens, Roger W., 4,250,033, Cl. 210-106.000.
"P.B.I." Procedes et Brevets Industriels: *See*—
Thieffry, Luc, 4,249,358, Cl. 52-745.000.
Pace Photographic Products, Inc.: *See*—
Breslau, Steven M., 4,249,822, Cl. 355-74.000.
Pace, W. David: *See*—
Gray, Randall C.; and Pace, W. David, 4,250,452, Cl. 328-1.000.
Pacific Western Systems, Inc.: *See*—
Worsham, Daniel, 4,249,846, Cl. 414-217.000.
Page, Victor J. Heating apparatus. 4,249,515, Cl. 126-438.000.
Palm, Michael M., to Dresser Industries, Inc. Drive system for crawler propelled machines. 4,249,625, Cl. 180-6.700.
Paoli, Pietro: *See*—
Costantini, Giuseppe; Serafini, Mauro; and Paoli, Pietro, 4,250,330, Cl. 562-409.000.
Papa, Sisto S.; and Condo, Antonino. Water-soluble disazo dyestuff derived from 4,4-diaminobenzanilide. 4,250,091, Cl. 260-160.000.
Papendieck, Friedrich; Kerschner, Guenther; Verfuerth, Rolf-Peter; and Rabold, Juergen, to Siemens Aktiengesellschaft. Apparatus for receiving and/or delivering signalling characters each having a plurality of polarity changes. 4,250,561, Cl. 364-900.000.
Parekh, Bhupendra K.; and Goldberger, William M., to Exxon Research & Engineering Co. Recovery of silicon carbide whiskers from coked, converted rice hulls by liquid-liquid separation. 4,249,700, Cl. 241-24.000.
Park, John R. Combination ladder and spare tire carrier. 4,249,683, Cl. 224-42.120.
Parke, Harry G., to Marine Electric Corporation. Alarm system for detecting a plurality of different alarm conditions. 4,250,484, Cl. 340-52.00F.
Parnell, David H.: *See*—
Sotheran, Arthur; and Parnell, David H., 4,249,373, Cl. 60-39.360.
Parodi, Sandro: *See*—
Giannini, Umberto; Albizzati, Enrico; and Parodi, Sandro, 4,250,104, Cl. 260-448.0AD.
Parshall, David G., to AMSTED Industries Incorporated. Conveying means for use in filtering devices. 4,250,036, Cl. 210-297.000.

Pascarella, Vincent J.: *See*—
Damico, Dennis J.; and Pascarella, Vincent J., 4,250,274, Cl. 525-127.000.

Paschke, Manfred: *See*—
Eggeling, Lothar; Paschke, Manfred; and Sahm, Hermann, 4,250,261, Cl. 435-190.000.

Passarotti, Carlo: *See*—
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Alessandro; Fumagalli, Angelo; Faustini, Franco; Ceserani, Roberto; and Usardi, Maria M., 4,250,188, Cl. 424-285.000.

Pasternack, Adalbert; and Warncke, Ernst, to Dragerwerk Aktiengesellschaft. Warning signal producing device for protective breathing apparatus. 4,249,473, Cl. 116-70.000.

Patel, Ramesh N.: *See*—
Hou, Ching-Tsang; Patel, Ramesh N.; and Laskin, Allen I., 4,250,259, Cl. 435-148.000.

Patureau, Myles A.; and Murray, Michael F., to United States of America, Agriculture. Cyclone dust analyzer for determining microdust content in fibers. 4,249,655, Cl. 209-31.000.

Paul, Maynard C.: *See*—
Cosimini, Gregory J.; Johnson, Leslie H.; Lo, David S.; Nelson, George F.; and Paul, Maynard C., 4,250,565, Cl. 365-87.000.

Paveglio, Gerald E., Jr.; Poehlman, Lawrence C.; and Werdin, Richard L., to Giddings & Lewis, Inc. Methods and apparatus for lead segment machining. 4,250,551, Cl. 364-474.000.

Pearson, Jerome, to United States of America, Air Force. Zero-g massmeter. 4,249,411, Cl. 73-12.000.

Pelletier, Jacques; and Berliet, Regis. Device for forming a web of parallel threads. 4,249,981, Cl. 156-441.000.

Pennsylvania Engineering Corporation: *See*—
Davis, Howard F., Jr.; and Persson, John A., 4,249,952, Cl. 106-103.000.

Pennwalt Corporation: *See*—
Przybylinski, John L., 4,250,046, Cl. 252-49.300.

Pentanyl Technologies, Inc.: *See*—
Ruskin, Richard P.; Zafar, Humayon Z.; Goens, Duane N.; Hyatt, David E.; and Kenney, Charlie W., 4,250,157, Cl. 423-417.000.

Penzel, Erich: *See*—
Ley, Gregor; Penzel, Erich; Rebafka, Walter; and Bott, Kaspar, 4,250,070, Cl. 260-29.6MM.

Pera, John D.: *See*—
Buckman, Robert H.; Hoekstra, Philip M.; and Pera, John D., 4,250,269, Cl. 525-6.000.

Peress, Jimmy Y.: *See*—
Sherwin, Martin B.; Peress, Jimmy Y.; and Gwozdz, Kenneth J., 4,250,344, Cl. 585-437.000.

Perkin-Elmer Corporation, The: *See*—
Sebens, Carl R.; and Fisher, Chester G., 4,250,553, Cl. 364-510.000.

Perr, Julius P., to Cummins Engine Company, Inc. Timing mechanism for a fuel supply system. 4,249,499, Cl. 123-502.000.

Perrey, Hermann; and Matner, Martin, to Bayer Aktiengesellschaft. Mixture of ammonia and alkoxylated poly-siloxanes and its use as a heat sensitizer. 4,250,071, Cl. 260-29.7NR.

Persson, John A.: *See*—
Davis, Howard F., Jr.; and Persson, John A., 4,249,952, Cl. 106-103.000.

Pesa, Frederick A.; and Graham, Anne M., to Standard Oil Company (Ohio), The. Process for the preparation of laotams. 4,250,093, Cl. 260-239.30A.

Peters, Kenneth D., to UOP Inc. Multiple stage hydrocarbon conversion process. 4,250,018, Cl. 208-49.000.

Peters, Kenneth D., to UOP Inc. Multiple stage hydrocarbon conversion process. 4,250,019, Cl. 208-49.000.

Petersen, Louis P., to General Electric Company. Process for the continuous manufacture of siloxane polymers. 4,250,290, Cl. 528-14.000.

Petersen, Paul S., to Novus Inc. Support for glass repair apparatus. 4,249,869, Cl. 425-13.000.

Pettersson, Kjell A.: *See*—
Bratt, Jan C.; Lorant, Stefan; and Pettersson, Kjell A., 4,249,377, Cl. 60-517.000.

Petzold, Manfred: *See*—
Asbeck, Adolf; Eckelt, Michael; Erwied, Werner; Heyden, Rudi; and Petzold, Manfred, 4,250,050, Cl. 252-354.000.

Pfaffle, Ernst, to Hans Sickinger Co. Machine and method for spiral binding of sheet groups with plastic thread. 4,249,278, Cl. 11-1.00A.

Pfeffer, John R., to Consolidated Fiberglass Products Co. Fiberglass mat. 4,250,221, Cl. 428-284.000.

Pfeifer, Rolf, to Siemens Aktiengesellschaft. X-ray diagnostic installation for X-ray photographs. 4,250,386, Cl. 250-402.000.

Pfister, Jurg R., to Syntex (U.S.A.) Inc. Compositions for and a method of preventing diabetic complications. 4,250,097, Cl. 260-335.000.

Philadelphia Gear Corporation: *See*—
Connolly, John R.; Gibson, David E.; Heimark, Edward L.; Quinn, Jerome B.; Speechley, Richard E.; and Winter, Richard L., 4,249,863, Cl. 416-185.000.

Philagro: *See*—
Rakoutz, Michel, 4,250,333, Cl. 568-652.000.

Philipp Holzmann AG: *See*—
Krabbe, Wilfried; and Simon, Walter, 4,249,870, Cl. 425-63.000.

Phillips Cables Limited: *See*—
Beach, Shirley, 4,250,132, Cl. 264-68.000.

Phillips, George R.: *See*—
Darwent, Richard H.; Phillips, George R.; and Karol, Herman S., 4,249,640, Cl. 187-1.00R.

Phillips Petroleum Company: *See*—
Bresson, Clarence R., 4,250,067, Cl. 260-28.5AS.
Callejas, Ricardo J., 4,249,907, Cl. 23-230.00A.
Crowley, Ralph P., 4,249,387, Cl. 62-54.000.
Eddy, William R.; and Richards, Frank P., 4,249,479, Cl. 118-708.000.
Farrar, Ralph C., 4,250,270, Cl. 525-54.000.
Funk, Gary L., 4,249,908, Cl. 23-230.00A.
Holtz, Hans D., deceased; and Bonazza, Benedict R., 4,249,912, Cl. 44-71.000.
LaSpisa, Ronald J.; and McElroy, Arthur H., 4,250,130, Cl. 264-40.700.

Phillips, Richard E., Jr., to Monsanto Company. Flame retardant nylon having improved moldability. 4,250,065, Cl. 260-18.00N.

Photon Chroma, Inc.: *See*—
Plumadore, John D., 4,249,328, Cl. 40-158.00B.

Piber, Earl T.: *See*—
Larkin, Robert E.; and Piber, Earl T., 4,250,369, Cl. 200-339.000.

Pichler, Ludwig: *See*—
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Hoefke, Wolfgang; Gaida, Wolfram; and Pichler, Ludwig, 4,250,186, Cl. 424-273.00R.

Piesch, Steffen: *See*—
Dorries, Peter; Piesch, Steffen; and Wolf, Alfons, 4,250,282, Cl. 525-509.000.

Pignan, Jean-Louis: *See*—
Charvin, Roger; and Pignan, Jean-Louis, 4,250,003, Cl. 204-098.000.

Pisano, Daniel J., Jr.: *See*—
Hounsfield, Godfrey N.; Waltham, Richard M.; Pisano, Daniel J., Jr.; and Olson, Erlvada A., 4,250,387, Cl. 250-445.00T.

Plantard, Dominique: *See*—
Levecque, Marcel, deceased; Levecque, Marc, administrator; Batigelli, Jean A.; and Plantard, Dominique, 4,249,926, Cl. 65-5.000.

Plante, Emile. Lobster buoy spindle. 4,249,277, Cl. 9-8.00R.

Plas/Steel Products, Inc.: *See*—
Shobert, Samuel M.; and Fish, Elson B., 4,249,980, Cl. 156-441.000.

Pliskin, William A.: *See*—
Gardiner, James R.; Pliskin, William A.; Revitz, Martin; and Shepard, Joseph F., 4,249,968, Cl. 148-174.000.

Plumadore, John D., to Photon Chroma, Inc. Electrophotographic slide and method of making same. 4,249,328, Cl. 40-158.00B.

Pobst, David F., Jr.; and Bailey, Jesse M., Jr., to Sid Richardson Carbon & Gasoline Co. Carbon black reactor with improved burner. 4,250,145, Cl. 422-151.000.

Pocock, John F. E.; Krishnakumar, Suppayan M.; Mahajan, Gautam K.; and Clark, Richard E., to Continental Group, Inc., The. Plastic container with a generally hemispherical bottom wall having hollow legs projecting therefrom. 4,249,667, Cl. 215-1.00C.

Poehlman, Lawrence C.: *See*—
Paveglio, Gerald E., Jr.; Poehlman, Lawrence C.; and Werdin, Richard L., 4,250,551, Cl. 364-474.000.

Pogoda, Dieter, to Messerschmitt-Boelkow-Blohm GmbH. Lacquer coating, especially on metal surfaces. 4,250,219, Cl. 428-212.000.

Pokrandt, Kurt. Current sensing circuitry. 4,250,501, Cl. 340-664.000.

Pola Chemical Industries, Inc.: *See*—
Ochiai, Michio; Tonooka, Noriaki; and Matubara, Kenkichi, 4,250,193, Cl. 424-358.000.

Polansky, Herbert; and Spector, George, to Polansky, Herbert. Decorated disposable diaper. 4,249,532, Cl. 128-287.000.

Polaroid Corporation: *See*—
Borror, Alan L.; and Hill, Ruth L., 4,250,244, Cl. 430-217.000.
Buldini, Daniel A., 4,249,818, Cl. 354-312.000.
Douglas, Lawrence M., 4,249,811, Cl. 354-86.000.

Poler, Stanley. Intraocular lens. 4,249,271, Cl. 3-13.000.

Poler, Stanley. Intraocular lens. 4,249,272, Cl. 3-13.000.

Polimine, Robert F., to General Signal Corporation. Expansion joint with interior grounding continuity bond. 4,250,350, Cl. 174-86.000.

Pombo, Jorge. Combined closure and dispensing control top for containers. 4,249,678, Cl. 222-409.000.

Pommerenke, Horst: *See*—
Grundmann, Edgard; Herbst, Udo; and Pommerenke, Horst, 4,249,375, Cl. 60-309.000.

Poncioni, Bruno, to Hoffmann-La Roche Inc. Light-screening benzoxazole derivatives. 4,250,315, Cl. 346-198.000.

Ponte, Raymon. Combination flashlight and circuit tester. 4,250,446, Cl. 324-53.000.

Postenreider, Erwin: *See*—
Diermayer, Werner; Kutzner, Luitpold; and Postenreider, Erwin, 4,249,694, Cl. 236-1.00G.

Potochnik, Frank S., to General Electric Company. Steam condensate and waste water recycling process. 4,249,486, Cl. 122-451.00R.

Potts, P. Keith, to Eastman Kodak Company. Safety floating step assembly for platform. 4,249,634, Cl. 182-1.000.

Pouvreau, Philippe: *See*—
Constant, Georges; Haran, Raymond; Lebugle, Albert; Zaouk, Aref; Morancho, Roland; and Pouvreau, Philippe, 4,250,205, Cl. 427-87.000.

Povel, Rolf: *See*—
Luckel, Joachim; and Povel, Rolf, 4,249,456, Cl. 91-433.000.

Power-D, Inc.: *See*—
Chambers, Robert B., 4,249,487, Cl. 123-44.00C.

PPG Industries, Inc.: *See*—
Carleton, G. Robert, 4,249,928, Cl. 65-182.200.
Carlin, William W., 4,250,013, Cl. 204-282.000.

Pratt, David S., to Pratt, David S. Biopsy device. 4,249,541, Cl. 128-753.000.
Pratt, Lindsay L., to Grabber, Inc. Tree ball grabber. 4,249,344, Cl. 47-76.000.
Preload Technology, Inc.: *See*—
Marchaj, Tadeusz J., 4,249,352, Cl. 52-167.000.
Preniczny, Robert B.: *See*—
Anderson, Bruce W.; Jessup, Gregory M.; and Preniczny, Robert B., 4,249,642, Cl. 188-73.200.
Preston, Richard D.: *See*—
Snoy, Joseph B.; and Preston, Richard D., 4,249,647, Cl. 192-103.0FA.
Price, James E., to Adver-Togs, Inc. Cap visor. 4,249,269, Cl. 2-195.000.
Procter & Gamble Company, The: *See*—
Jones, Kenneth L., 4,250,043, Cl. 252-8.600.
Kitko, David J., 4,249,274, Cl. 4-227.000.
Produits Chimiques Ugine Kuhlmann: *See*—
Charvin, Roger; and Pignan, Jean-Louis, 4,250,003, Cl. 204-098.000.
Prohl, Robert: *See*—
Adolph, Erich; Bayrak, Unal; Prohl, Robert; Schmidt, Gerhard; and Stecker, Walter, 4,250,535, Cl. 361-335.000.
Protectoseal Company, The: *See*—
Shaw, Harry N., 4,249,563, Cl. 137-315.000.
Provencher, Roland; and Williams, Charles. Device for suspending a sign from a ceiling and removing same therefrom. 4,249,763, Cl. 294-19.00R.
Pruden, Samuel H., to Cushman Industries, Incorporated. Fluid coupling for a rotary chuck. 4,249,459, Cl. 92-106.000.
Pruvot, Francois D.; and Chesnel, Yvonnick P., to Regie Nationale des Usines Renault. Planetary speed reducer with deformable ring. 4,249,431, Cl. 74-785.000.
Przybylinski, John L., to Pennwalt Corporation. Diethanol disulfide as an extreme pressure and anti-wear additive in water soluble metal-working fluids. 4,250,046, Cl. 252-49.300.
Puch, Diethelm: *See*—
Link, Manfred; and Puch, Diethelm, 4,249,829, Cl. 400-144.200.
Pugachev, Arkady K.: *See*—
Kolosov, Ivan A.; Kuryshev, Nikolai V.; Ivanyatov, Jury E.; Kalininskaya, Vera N.; Yartsev, Igor K.; Pugachev, Arkady K.; and Savina, Svetlana M., 4,250,204, Cl. 427-58.000.
Pullman Incorporated: *See*—
Glassmeyer, John J., 4,249,783, Cl. 308-187.000.
Pulvari, Charles F. Radiant energy systems, memories and thermal imaging methods and apparatus. 4,250,384, Cl. 250-330.000.
Puschel, Walter: *See*—
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Pyott-Boone Machinery Corporation: *See*—
Teti, John J., 4,249,854, Cl. 414-685.000.
Quarz-Zeit AG: *See*—
Sudler, Roland; and Reiferscheid, Norbert, 4,250,576, Cl. 368-323.000.
Quemore, William J., Sr. Guitar and chord playing attachment pivotally mounted thereon. 4,249,450, Cl. 84-317.000.
Quinn, Jerome B.: *See*—
Connolly, John R.; Gibson, David E.; Heimark, Edward L.; Quinn, Jerome B.; Speechley, Richard E.; and Winter, Richard L., 4,249,863, Cl. 416-185.000.
Raabe, Gerhard, to U.S. Philips Corporation. Capacitance diode with particular doping profile. 4,250,514, Cl. 357-14.000.
Rabold, Juergen: *See*—
Papendieck, Friedrich; Kerschner, Guenther; Verfuerth, Rolf-Peter; and Rabold, Juergen, 4,250,561, Cl. 364-900.000.
Radosevich, Lawrence D.: *See*—
Kouchich, Allan V.; Radosevich, Lawrence D.; Blanchard, John C.; and Thomas, Neal F., 4,250,482, Cl. 338-275.000.
Rakoutz, Michel, to Philagro. Process for the selective monoetherification of pyrocatechol. 4,250,333, Cl. 568-652.000.
Ramesohl, Hubert: *See*—
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Ranco Incorporated: *See*—
Rossi, Guglielmo, 4,250,367, Cl. 200-275.000.
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Rapson, W. Howard: *See*—
Gilbert, Allan F.; and Rapson, W. Howard, 4,249,990, Cl. 162-17.000.
Raque, Glen F.; and Robinson, Edward A. Automatic valve clearoff. 4,249,560, Cl. 137-240.000.
Rasberger, Michael: *See*—
Rody, Jean; and Rasberger, Michael, 4,250,268, Cl. 525-100.000.
Ratigan, Brian J., to Fischer & Porter Company. Chlorine dioxide generating system. 4,250,144, Cl. 422-112.000.
Ratz, James W.: *See*—
Chapman, James; and Ratz, James W., 4,250,441, Cl. 318-626.000.
Rausch, Carl W.: *See*—
McDonald, Patrick D.; and Rausch, Carl W., 4,250,035, Cl. 210-198.200.
RCA Corporation: *See*—
Chang, Zung F.; and Minton, Robert, 4,250,541, Cl. 363-28.000.
Denlinger, Edgar J., 4,250,520, Cl. 357-68.000.
Jebens, Robert W., 4,249,959, Cl. 136-244.000.
Limberg, Allen L., 4,250,461, Cl. 330-288.000.
Schade, Otto H., Jr., 4,250,464, Cl. 331-65.000.
Schade, Otto H., Jr., 4,250,500, Cl. 340-628.000.
Schnable, George L.; and Wu, Chung P., 4,249,960, Cl. 148-1.500.
Schwarzmann, Alfred, 4,250,475, Cl. 333-205.000.
Steckler, Steven A.; and Balaban, Alvin R., 4,250,525, Cl. 358-148.000.
Wright, David I., 4,250,521, Cl. 358-8.000.
Reale, Lucio V. Process and apparatus for separating tar from a tar sand mixture. 4,250,017, Cl. 208-11.0LE.
Rebafka, Walter: *See*—
Ley, Gregor; Penzel, Erich; Rebafka, Walter; and Bott, Kaspar, 4,250,070, Cl. 260-29.6MM.
Rechenberg, Cornelius. Process of manufacturing artificial breasts. 4,249,975, Cl. 156-245.000.
Red Arrow Products Company: *See*—
Underwood, Gary L.; and Wendorff, William L., 4,250,199, Cl. 426-533.000.
Redecker, Klaus: *See*—
Hagel, Rainer; and Redecker, Klaus, 4,250,294, Cl. 528-210.000.
Reed, George A.: *See*—
August, Paul R.; and Reed, George A., 4,250,301, Cl. 536-4.000.
Reel, Henning: *See*—
Hugl, Herbert; Wolfrum, Gerhard; Reel, Henning; Kunnel, Werner; Kuth, Robert; and Gohrbandt, Wilhelm, 4,249,275, Cl. 8-532.000.
Reel-O-Matic Systems, Incorporated: *See*—
Brooks, Dannie L.; and Fields, Ronald S., 4,249,705, Cl. 242-78.600.
Rees, James D.: *See*—
Durbin, John A.; and Rees, James D., 4,250,538, Cl. 362-97.000.
Regie Nationale des Usines Renault: *See*—
Colinet, Andre; Schwartz, Christian; and Francois, Jean-Pierre, 4,249,427, Cl. 74-471.00R.
Pruvot, Francois D.; and Chesnel, Yvonnick P., 4,249,431, Cl. 74-785.000.
Rehrig Pacific Company: *See*—
Crolli, Gary M., 4,249,671, Cl. 220-469.000.
Reich, Richard B., to Vapor Corporation. Heavy fuel oil nozzle. 4,249,885, Cl. 431-38.000.
Reichenbach, Jerry D.; and Christiansen, Keith W., to CR Industries. Insert molding apparatus with movable flash barrier. 4,249,874, Cl. 425-127.000.
Reiferscheid, Norbert: *See*—
Sudler, Roland; and Reiferscheid, Norbert, 4,250,576, Cl. 368-323.000.
Reinke, Friedhelm; and Stengel, Edgar, to AEG-Elotherm, G.m.b.H. Apparatus for tempering the surfaces of mutually displaced cams of a cast-iron camshaft. 4,249,724, Cl. 266-261.000.
Reisch, John W.: *See*—
Rounbehler, David P.; and Reisch, John W., 4,249,904, Cl. 23-230.00M.
Reisert, Arthur: *See*—
Bode, Rudolf; Reisert, Arthur; Turk, Gunter; and Strack, Hans, 4,250,081, Cl. 260-42.460.
Reitmeier, Lutz: *See*—
Reuland, Joachim; Hinze, Herbert; and Reitmeier, Lutz, 4,249,544, Cl. 131-21.00B.
Rengo Co., Ltd.: *See*—
Tokuno, Masateru, 4,249,847, Cl. 414-330.000.
Renzi, Pierluigi; and Baroncelli, Vittorio, to Snamprogetti S.p.A. Composition adapted for the determination of tri-iodo thyronine and diagnosis method employing same. 4,250,253, Cl. 435-7.000.
Repp, Garry E. Sign apparatus. 4,249,715, Cl. 248-545.000.
Research-Cottrell, Inc.: *See*—
Biedell, Edward L.; and Ferb, Robert J., 4,250,152, Cl. 423-242.000.
Resina Automatic Machinery Co. Inc.: *See*—
Guerra, Frank J., 4,249,397, Cl. 64-29.000.
Reticon Corporation: *See*—
Tseng, Hsin-fu, 4,250,517, Cl. 357-24.000.
Reuland, Joachim; Hinze, Herbert; and Reitmeier, Lutz, to Hauni-Werke Korber & Co. KG. Method and apparatus for generating signals for adjustment of cigarette rod making machines or the like. 4,249,544, Cl. 131-21.00B.
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Lavigna, Robert J.; and Reusser, Raymond E., 4,249,988, Cl. 156-605.000.
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Gardiner, James R.; Pliskin, William A.; Revitz, Martin; and Shepard, Joseph F., 4,249,968, Cl. 148-174.000.
Rex, Gary C., to Composite Technology Corporation. Method of forming a composite structure. 4,250,136, Cl. 264-257.000.
Rheinische Kalksteinwerke GmbH: *See*—
Schulze-Heil, Bernhard, 4,249,894, Cl. 432-95.000.
Rhode, Norman G.: *See*—
Beasley, Marvin L.; and Rhode, Norman G., 4,250,324, Cl. 560-62.000.
Richard, Francoise: *See*—
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Richards, Frank P.: *See*—
Eddy, William R.; and Richards, Frank P., 4,249,479, Cl. 118-708.000.
Richards, M. David. Athletic club swing training device. 4,249,762, Cl. 273-193.00A.

Richardson, Joseph: *See—*
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Richert, Gabriel M.: *See—*
Mavel, Gerard F. G.; Morel, Emile M. J.; and Richert, Gabriel M., 4,250,222, Cl. 428-285.000.
Richmond, Robert L.; and Wyar, Paul F., to Digital Communications Corporation. Baseband DC offset detector and control circuit for DC coupled digital demodulator. 4,250,458, Cl. 329-112.000.
Richter Gedeon Vegyeszeti Gyar R.T.: *See—*
Felfoldi, Karoly; Apjok, Jozsef; Bartok, Mihaly; Czombos, Jozsef; Molnar, Arpad; Noteisz, Ferenc; Karpati, Egon; and Szporny, Laszlo, 4,250,310, Cl. 544-379.000.
Ricoh Company, Ltd.: *See—*
Fuwa, Jyoichi; and Asakawa, Toshifumi, 4,250,526, Cl. 358-294.000.
Sakai, Katsuo, 4,250,239, Cl. 430-42.000.
Shimada, Masaru; Maruyama, Shoji; and Tamura, Hiroshi, 4,250,240, Cl. 430-66.000.
Tsubuko, Kazuo; Kimura, Taro; Tasaka, Motoo; and Hashimoto, Junichiro, 4,250,241, Cl. 430-114.000.
Watanabe, Junichi; Koide, Hiroshi; and Temmyo, Shigemoto, 4,250,416, Cl. 310-13.000.
Riecke, Edgar E., to Eastman Kodak Company. Melt process for preparing copolyesters using triarylphosphine catalysts. 4,250,281, Cl. 525-444.000.
Riedler, Walter. Process for preparing breast pads. 4,250,137, Cl. 264-554.000.
Riegger, Helena: *See—*
Brul, Jakob; and Riegger, Helena, 4,249,485, Cl. 122-441.000.
Riessberger, Klaus: *See—*
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Rieter Machine Works Ltd: *See—*
Stalder, Herbert, 4,249,286, Cl. 19-97.000.
Riggs, Robert R.; and Hunt, Paulmer D., to Bendix Corporation, The. Fluidic motor actuator. 4,249,453, Cl. 91-59.000.
Rill, James C.: *See—*
Stephens, Craig P.; and Rill, James C., 4,249,299, Cl. 29-578.000.
Rimmer, Matthew P.: *See—*
Hilbert, Robert S.; Gustafson, Darryl E.; Harris, Thomas I.; and Rimmer, Matthew P., 4,249,805, Cl. 352-85.000.
Ringrose, Peter S.: *See—*
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Ritter, Gerhard: *See—*
Gott, Hans; Ritter, Josef; Ritter, Klaus; Ritter, Gerhard; and Schmidt, Gerhard, 4,249,841, Cl. 414-14.000.
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Ritter, Terry F.: *See—*
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Rittersdorf, Walter: *See—*
Wielinger, Hans; Rittersdorf, Walter; Bleisteiner, Manfred; Zimmermann, Gerd; Werner, Wolfgang; and Vomel, Wolfgang, 4,250,256, Cl. 435-32.000.
Rivetti, Enrico; and Audisio, Filippo, to Centro Ricerche Fiat S.p.A. Solar air and water heater. 4,249,512, Cl. 126-435.000.
Robert Bosch GmbH: *See—*
Drews, Ulrich; Schnurle, Hans; and Horbelt, Michael, 4,249,498, Cl. 123-478.000.
Eheim, Franz; and Straubel, Max, 4,249,497, Cl. 123-446.000.
Honig, Gunter; and Moller, Heinz, 4,249,493, Cl. 123-416.000.
Robert H. Harris Company, Inc.: *See—*
Harris, Robert H., 4,249,758, Cl. 285-158.000.
Roberts, James K., to Bendix Corporation, The. Drum brake assembly with non-servo and duo-servo characteristics. 4,249,646, Cl. 188-328.000.
Roberts, Peter J.: *See—*
Syred, Nicholas; and Roberts, Peter J., 4,249,575, Cl. 137-812.000.
Robeson, Lloyd M.; Matzner, Markus; and Maresca, Louis M., to Union Carbide Corporation. Polyarylate blends with polyetherimides. 4,250,279, Cl. 525-425.000.
Robin, Marcel: *See—*
de Nucheze, Louis; and Robin, Marcel, 4,249,484, Cl. 122-32.000.
Robinson, Edward A.: *See—*
Raque, Glen F.; and Robinson, Edward A., 4,249,560, Cl. 137-240.000.
Robinson, Sam P.: *See—*
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Robota, Stephen: *See—*
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Rockwell International Corporation: *See—*
Budzyna, Edward S., 4,249,580, Cl. 139-450.000.
Spence, John R., 4,250,408, Cl. 307-237.000.
Rody, Jean; and Rasberger, Michael, to Ciba-Geigy Corporation. Polysilylesters having a polyalkylpiperidine as part of the polymer useful as light stabilizers for plastics. 4,250,268, Cl. 525-100.000.
Roegner, George P.; Hawley, Richard; Steen, Howard; and Biener, Sig, to Soundesign Corporation. Discotheque simulating home entertainment system. 4,250,537, Cl. 362-86.000.
Rogatkin, Alexandr A.: *See—*
Kalmykov, Vladimir N.; Musiiko, Vitaly A.; Khlopkov, Leonid P.; Gashenko, Stanislav I.; Rogatkin, Alexandr A.; Silakov, Grigory I.; Shipilov, Viktor F., deceased; Skibina, Elena S., administrator; Shipilov, Gennady V., administrator; and Shipilov, Fedor D., administrator, 4,249,989, Cl. 159-10.000.
Rogers, Howard H.: *See—*
DuPont, Preston S.; and Rogers, Howard H., 4,250,235, Cl. 429-211.000.
Rogers, Walter C., Jr. Wall-avoiding recliner chair. 4,249,772, Cl. 297-85.000.
Rohm and Haas Company: *See—*
Kiser, Ernest J.; and Latty, James A., 4,250,029, Cl. 210-652.000.
Rohrbach, Ronald P.; and Lester, George W., to UOP Inc. Preparation of support matrices for immobilized enzymes. 4,250,080, Cl. 260-42.460.
Rohrbach, Ronald P.; and Levy, Joseph, to UOP Inc. Regeneration of an immobilized enzyme system. 4,250,260, Cl. 435-176.000.
Rolls-Royce Ltd.: *See—*
Sotheran, Arthur; and Parnell, David H., 4,249,373, Cl. 60-39.360.
Romeyke, Norbert, to BBC Brown Boveri & Company Limited. Method and apparatus for dissipating heat in gas turbines during shut-down. 4,249,371, Cl. 60-39.040.
Rosa, Stephen: *See—*
Ellis, Harold; De Fonso, Alexander; and Rosa, Stephen, 4,250,398, Cl. 219-345.000.
Rosemount Inc.: *See—*
Dahlke, Charles J., 4,250,490, Cl. 340-870.370.
Rosenstock, Guetner: *See—*
Kattner, Erich; Rosenstock, Guetner; and Kern, Hans, 4,250,512, Cl. 346-140.00R.
Rosenthal, Martin B., to Stern Electronics, Inc. Drop target assembly for pinball game. 4,249,736, Cl. 273-127.00R.
Ross, Rupert F.: *See—*
Kleczkowski, Stawomir P.; and Ross, Rupert F., 4,250,529, Cl. 360-98.000.
Rossi, Alfred F. Counter for ticket-like items. 4,249,672, Cl. 221-264.000.
Rossi, Guglielmo, to Ranco Incorporated. Snap action switch blades. 4,250,367, Cl. 200-275.000.
Rossmann, Rudolf; Engel, Walter; and Diewald, Gunther, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Sabot projectile having a pyrotechnic composition. 4,249,466, Cl. 102-60.000.
Rotbart, Abraham: *See—*
Nestor, Jack; Ciment, Lawrence M.; and Rotbart, Abraham, 4,249,529, Cl. 128-207.170.
Rounbehler, David P.; and Reisch, John W., to Thermo Electron Corporation. Method and apparatus for extraction of airborne N-nitroso compounds without artifact formation. 4,249,904, Cl. 23-230.00M.
Roussel Uclaf: *See—*
Barthelemy, Pierre, 4,250,307, Cl. 544-030.000.
Rowland-Hill, Edward W., to Sperry Corporation. I[illegible] access module. 4,249,543, Cl. 130-27.00T.
Rowlette, John J., to Erway, Duane D., a part interest. Method and composition for retarding wate[illegible] evaporation. 4,250,140, Cl. 422-43.000.
Rozengauz, Solomon M.: *See—*
Talyzin, Nikolai V.; Rozengauz, Solomon M.; Tikhonov, Vasily F.; and Mosolov, Nikolai K., 4,250,028, Cl. 209-583.000.
Rubin, Carl S.: *See—*
Vilkomerson, David H. R.; Mezrich, Reuben S.; and Rubin, Carl S., 4,249,539, Cl. 128-660.000.
Rubner, Anthony C. System for signalized intersection control. 4,250,483, Cl. 340-40.000.
Ruckert, Hans: *See—*
Sander, Jurgen; Buhr, Gerhard; and Ruckert, Hans, 4,250,247, Cl. 430-270.000.
Rudszinat, Willy: *See—*
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Rudy, Michael W.; Langford, Forrest L.; and Therien, Robert D., to Terminal Data Corporation. Belt microfilm camera. 4,249,821, Cl. 355-64.000.
Rueb, John T., to Minnesota Mining and Manufacturing Company. Elongate sanding block. 4,249,349, Cl. 51-392.000.
Ruskin, Richard P.; Zafar, Humayon Z.; Goens, Duane N.; Hyatt, David E.; and Kenney, Charlie W., to Pentanyl Technologies, Inc. Method and apparatus for enriching the iron carbonyl content of a recycle gas stream. 4,250,157, Cl. 423-417.000.
Rutledge, Raleigh N.: *See—*
Hart, Edward; and Rutledge, Raleigh N., 4,249,875, Cl. 425-133.100.
Rutter, Harold T., to Sunnen Products Company. Adapter for honing mandrels. 4,249,348, Cl. 51-338.000.
S & C Electric Company: *See—*
Evans, David M.; and Sabis, Richard J., 4,250,476, Cl. 335-17.000.
S.E.P.M. Societe d'Exploitation des Procedes Marechal: *See—*
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Sabis, Richard J.: *See—*
Evans, David M.; and Sabis, Richard J., 4,250,476, Cl. 335-17.000.
Sable, Donald E.; and Sable, Donald E., II. Well tool. 4,249,831, Cl. 403-12.000.
Sable, Donald E., II: *See—*
Sable, Donald E.; and Sable, Donald E., II, 4,249,831, Cl. 403-12.000.

Saegusa, Takeo; Yamada, Akira; Iwase, Masaaki; and Iwatani, Akitoshi, to Daikin Kogyo Co., Ltd. Fluorine-containing polyesters, and their production and use. 4,250,300, Cl. 528-401.000.

Saele, Arvid H., to Deere & Company. Extractor tube arrangement for internal combustion engine air cleaner system. 4,249,922, Cl. 55-315.000.

Sahm, Hermann: *See*—
Eggeling, Lothar; Paschke, Manfred; and Sahm, Hermann, 4,250,261, Cl. 435-190.000.

Sai-Halasz, George A.: *See*—
Esaki, Leo; Tsu, Raphael; Sai-Halasz, George A.; and Chang, Leroy L., 4,250,515, Cl. 357-16.000.

Saint-Gobain Industries: *See*—
Levecque, Marcel, deceased; Levecque, Marc, administrator; Batigelli, Jean A.; and Plantard, Dominique, 4,249,926, Cl. 65-5.000.

Saito, Motoyasu; and Mukohyama, Hideaki, to Kohjin Co., Ltd. Process for preparing cellulose ether. 4,250,305, Cl. 536-84.000.

Saito, Shigeki: *See*—
Tahara, Kazuo; Tagima, Fumio; Motegi, Shoji; and Saito, Shigeki, 4,250,422, Cl. 310-227.000.

Saito, Toshiaki, to Kabushiki Kaisha Suwa Seikosha. Digital alarm wristwatch. 4,250,573, Cl. 368-73.000.

Saitou, Asao: *See*—
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Sakagami, Koji: *See*—
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Sakaguchi, Shinji: *See*—
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Sakai, Katsuo, to Ricoh Company, Ltd. Color electrostatographic process and material. 4,250,239, Cl. 430-42.000.

Sakakibara, Naoji, to Aisin Seiki Kabushiki Kaisha. Vacuum servomotor. 4,249,457, Cl. 91-450.000.

Sakakibara, Tadao: *See*—
Futatsuka, Rensei; and Sakakibara, Tadao, 4,249,941, Cl. 75-153.000.

Sakamoto, Norman Y., to International Telephone and Telegraph Corporation. Electronic trigger for a radio frequency source. 4,250,454, Cl. 328-155.000.

Sakamoto, Teruhisa; Sekizawa, Kazuhiko; and Kihara, Keiichi, to Toyo Soda Manufacturing Co., Ltd. Process for producing methacrolein. 4,250,339, Cl. 568-471.000.

Sakaue, Yoshikazu; and Maruyama, Hisaichi, to Mitsubishi Denki Kabushiki Kaisha. Automatic taping apparatus. 4,249,704, Cl. 242-7.230.

Sallmann, Alfred; and Baschang, Gerhard, to Ciba-Geigy Corporation. Novel substituted phenylacetic acid amide compounds. 4,250,192, Cl. 424-309.000.

Salusinszky, Andor L. Treating used hydrocarbon lubricating oils. 4,250,021, Cl. 208-181.000.

Samis, James M.; and Waechter, Walter C., to Thermonetics, Inc. Method and system for slurrying fibrous organic materials and removing grit therefrom. 4,250,023, Cl. 209-3.000.

Samuelsson, Mokjas J., to Josam Lastbilteknik AB. Bench aligner. 4,249,409, Cl. 72-305.000.

Sander, Jurgen; Buhr, Gerhard; and Ruckert, Hans, to Hoechst Aktiengesellschaft. Acid degradable radiation-sensitive mixture. 4,250,247, Cl. 430-270.000.

Sandera, Ladislav, to Swiss Aluminium Ltd. UV-Light-sensitive sheet for graphic applications. 4,250,213, Cl. 427-409.000.

Sanders, James M.: *See*—
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,250,194, Cl. 426-3.000.
Sprecker, Mark A.; Sanders, James M.; Schreiber, William L.; Watkins, Hugh; Vinals, Joaquin F.; Shuster, Edward J.; O'Rourke, Thomas J.; Hagedorn, Myrna L.; and Klemarczyk, Philip, 4,250,338, Cl. 568-343.000.

Sandrock, Gary D.; and Keresztes, Stephan L., to International Nickel Co., Inc., The. Mischmetal-nickel-iron hydrogen storage compound. 4,249,940, Cl. 75-122.000.

Sanford, Craig A.: *See*—
Bausch, James F.; Brandt, Burkhard A.; and Sanford, Craig A., 4,250,479, Cl. 336-208.000.

Sanford, Karl J., to Eastman Kodak Company. Assay method for isoenzyme activity. 4,250,255, Cl. 435-15.000.

Sankokiki Kabushiki Kaisha: *See*—
Yasue, Setsuo; and Yamamoto, Tomio, 4,249,682, Cl. 224-42.230.

Sante Fe International Corporation: *See*—
Loland, Sven, 4,249,610, Cl. 166-360.000.

Sarosy, Edmund F.: *See*—
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Sasaki, Kenji: *See*—
Nakajima, Koichi; Ishiguro, Tomoji; Okamoto, Tokuhiko; Konaka, Minoru; Nagai, Minoru; Higuchi, Kanji; and Sasaki, Kenji, 4,250,426, Cl. 313-143.000.

Sasaki, Masayuki; and Gotou, Shuichi, to Tokyo Shibaura Electric Co., Ltd. Digital control for a cooking time and power of an electric cooking device. 4,250,370, Cl. 219-10.55B.

Sasaki, Nobuo; Nakano, Moto'o; Kobayashi, Yasuo; and Iwai, Takashi, to Fujitsu Limited. Semiconductor memory device. 4,250,569, Cl. 365-185.000.

Satoh, Yoji: *See*—
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Savage, Harlow D., Jr. Steam trap monitor. 4,249,697, Cl. 236-94.000.

Save Fuel Corporation: *See*—
Woolfolk, Charles E., 4,249,883, Cl. 431-20.000.

Savina, Svetlana M.: *See*—
Kolosov, Ivan A.; Kuryshev, Nikolai V.; Ivanyatov, Jury E.; Kalininskaya, Vera N.; Yartsev, Igor K.; Pugachev, Arkady K.; and Savina, Svetlana M., 4,250,204, Cl. 427-58.000.

Sawada, Yoshio: *See*—
Kawasaki, Masahiro; and Sawada, Yoshio, 4,250,413, Cl. 307-293.000.

Sawby, Kenneth J. Jack holder. 4,249,685, Cl. 224-42.45R.

Scans Associates, Inc.: *See*—
Smith, Richard L.; and Van Allen, Kent, 4,250,543, Cl. 364-105.000.

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Meyer, Robert B.; Schaefer, Harold W.; and Kronmiller, Richard E., 4,249,281, Cl. 15-340.000.

Scharf, Helmut; Franz, Gerhard; and Hokele, Gunther, to Chemische Werke Huls Aktiengesellschaft. Process for the production of acetone from isobutyraldehyde. 4,250,119, Cl. 568-389.000.

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Gaunaurd, Guillermo C.; Uberall, Herbert M.; and Scharnhorst, Kurt P., 4,249,421, Cl. 73-589.000.

Scheerman, Jacobus H.: *See*—
Bitter, Johan G. A.; Maas, Rudolf J.; and Scheerman, Jacobus H., 4,250,335, Cl. 568-771.000.

Schefbauer, Rupert J., to Inmont Corporation. Modified phenolic resinates and inks. 4,250,066, Cl. 260-25.000.

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Johnson, Gerard F.; and Schilke, Peter W., 4,249,913, Cl. 51-295.000.

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Schmanski, Donald W., to High Performance Composites, Inc. Highway median delineator. 4,249,832, Cl. 404-6.000.

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Morrell, Roger J.; Larson, William C.; and Schmidt, Robert D., 4,249,777, Cl. 299-4.000.

Schmitt, Frederick L.: *See*—
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,250,194, Cl. 426-3.000.
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Schmitz, Norbert J., to Bethlehem Steel Corporation. Low differential coke oven heating system. 4,249,997, Cl. 202-142.000.

Schnable, George L.; and Wu, Chung P., to RCA Corporation. Laser rounding a sharp semiconductor projection. 4,249,960, Cl. 148-1.500.

Schnall, Ira H.; and Mott, Walter W., to Copes-Vulcan. Orifice trim and backpressure plate for high pressure valves. 4,249,574, Cl. 137-625.300.

Schnurle, Hans: *See*—
Drews, Ulrich; Schnurle, Hans; and Horbelt, Michael, 4,249,498, Cl. 123-478.000.

Schoebel, Gottfried: *See*—
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Schreck, Ronald: *See*—
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Schroeder, Lawrence E.; and Burgess, Carlton M. Composite molded article and method of making the same. 4,249,517, Cl. 126-450.000.
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Schuler, Murry W. Combine. 4,249,542, Cl. 130-27.00T.
Schultz, Thomas J., to Midland-Ross Corporation. Method of generating carrier gas. 4,249,965, Cl. 148-27.000.
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Lazarz, Christine A.; Cook, Edward H., Jr.; and Schulz, Arthur C., 4,250,002, Cl. 204-98.000.
Schulze-Heil, Bernhard, to Rheinische Kalksteinwerke GmbH. Blast furnace for heating granular material. 4,249,894, Cl. 432-95.000.
Schundehutte, Karl H.: *See*—
Kruckenberg, Winfried; and Schundehutte, Karl H., 4,249,902, Cl. 8-525.000.
Schwanz, Wilfried; and Seiffert, Ulrich, to Volkswagenwerk Aktiengesellschaft. Passive safety belt arrangement for vehicles, in particular passenger automobiles. 4,249,756, Cl. 280-804.000.
Schwartz, Christian: *See*—
Colinet, Andre; Schwartz, Christian; and Francois, Jean-Pierre, 4,249,427, Cl. 74-471.00R.
Schwarzmann, Alfred, to RCA Corporation. Adjustable passband filter. 4,250,475, Cl. 333-205.000.
Schwender, Charles F.; and Sunday, Brooks R., to Warner-Lambert Company. Substituted 10-oxo-10H-pyridazino(6,1-b)quinazoline-2-carboxylic acids. 4,250,177, Cl. 424-250.000.
Scott & Fetzer Company, The: *See*—
Lee, Maw H., 4,250,400, Cl. 219-549.000.
Scott Paper Company: *See*—
Lamplugh, Roland J., 4,250,005, Cl. 204-159.150.
Libby, Craig R., 4,250,382, Cl. 250-302.000.
Scribner, Charles G. Cultivating apparatuses and process. 4,249,613, Cl. 172-60.000.
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Smith, Neil C.; and Scrutchfield, Donald H., 4,249,698, Cl. 239-1.000.
Seale, Virgil L.; and Goretta, Louis A., to Nalco Chemical Company. Mixed catalyst for the hydrolysis of nitriles to amides. 4,250,111, Cl. 564-129.000.
Searle, Robert J. G.; and Day, Janet A., to Shell Oil Company. Esters of 2-carboxy-3-azabicyclo-(3.1.0)hex-2-ene. 4,249,936, Cl. 71-95.000.
Sebastian International Inc.: *See*—
Cusenza, John, 4,249,549, Cl. 132-36.00C.
Sebens, Carl R.; and Fisher, Chester G., to Perkin-Elmer Corporation, The. Fluid flow measurement system. 4,250,553, Cl. 364-510.000.
Secoura, Ralph J.; and Howard, Thomas J., Jr., to Black & Decker, Inc. Arrangement for protecting a rotary device from impact thrust forces. 4,249,310, Cl. 30-276.000.
Sedelmayer, Franz X., to Sedelmayer, Franz X. Transporter vehicle for vehicles and containers. 4,249,851, Cl. 414-494.000.
Seifert, Horst: *See*—
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Seiffert, Ulrich: *See*—
Schwanz, Wilfried; and Seiffert, Ulrich, 4,249,756, Cl. 280-804.000.
Seki, Ikuo; and Kato, Masahiko, to Toppan Printing Co., Ltd. Color facsimile previewer. 4,250,522, Cl. 358-76.000.
Sekiya, Fukuo: *See*—
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Sekizawa, Kazuhiko: *See*—
Sakamoto, Teruhisa; Sekizawa, Kazuhiko; and Kihara, Keiichi, 4,250,339, Cl. 568-471.000.
Seko, Shigeo: *See*—
Tsuzuki, Kanemitsu; Motobayashi, Kozo; Watanabe, Kazuo; Kito, Yastami; and Seko, Shigeo, 4,249,369, Cl. 57-263.000.
Sendecki, Steve. Dual image viewer with mirror adjusting means. 4,249,797, Cl. 350-174.000.
Sento, Hiroshi; Tanabe, Shoji; Shimozu, Tadao; Yamashita, Seiji; and Miyashita, Kunio, to Hitachi, Ltd. Rotor of synchronous machines. 4,250,424, Cl. 310-261.000.
Sentoku, Hideshi, to Laurel Bank Machine Co., Ltd. Coin guiding device for use in a coin processing machine. 4,249,553, Cl. 133-1.00A.
Serafini, Mauro: *See*—
Costantini, Giuseppe; Serafini, Mauro; and Paoli, Pietro, 4,250,330, Cl. 562-409.000.
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Leclerc, Jean-Francois; and Desbois-Chauvette, Colette, 4,249,439, Cl. 83-71.000.
Setani, Yosuke. Golf bag. 4,249,586, Cl. 150-1.50C.
Seybold, Guenther: *See*—
Eilingsfeld, Heinz; Hansen, Guenter; Seybold, Guenther; and Zeidler, Georg, 4,250,090, Cl. 260-158.000.
Seymour, John P.: *See*—
Beitchman, Burton D.; Jefferson, Donald E.; and Seymour, John P., 4,250,293, Cl. 528-93.000.
SGF - Suddeutsche Gelenkscheibenfabrik GmbH & Co. KG: *See*—
Ziegler, Gunther, 4,249,396, Cl. 64-27.0NM.
Shackle, Peter W.: *See*—
Davis, James A.; MacPherson, William F.; and Shackle, Peter W., 4,250,409, Cl. 307-252.00A.
Shagurin, Anatoly S.: *See*—
Mikhailov, Viktor V.; Karakovsky, Alexandr K.; Dyachenko, Petr Y.; Ivanov, Jury S.; Mikhailov, Igor V.; Lunin, Mikhail G.; Buyanov, Alexei V.; Konstantinov, Alexei A.; Shagurin, Anatoly S.; Kirillov, Alexandr P.; Mikhailov, Oleg V.; and Khaimov, Arkady S., 4,249,871, Cl. 425-111.000.
Shanks, Ian A., to National Research Development Corporation. Apparatus for displaying waveforms on a matrix display. 4,250,503, Cl. 340-754.000.
Shapiro, Eugene; Vitek, John M.; and Smith, Warren F., Jr., to Olin Corporation. Copper base alloy containing manganese and cobalt. 4,249,942, Cl. 75-157.500.
Shapiro, Jerrold M., to Boston University, The Trustees of. Method and apparatus suitable for ocular blood flow analysis. 4,249,825, Cl. 356-223.000.
Sharp Kabushiki Kaisha: *See*—
Mimasu, Kazuo, 4,249,746, Cl. 369-221.000.
Shatynski, Stephen: *See*—
Golden, Ronald; Kulaga, Matthew S.; and Shatynski, Stephen, 4,250,076, Cl. 260-38.000.
Shaw, David N.; and First, David J., to Dunham-Bush, Inc. Control system for screw compressor. 4,249,866, Cl. 417-280.000.
Shaw, Harry N., to Protectoseal Company, The. Manifold for replacing relief valves. 4,249,563, Cl. 137-315.000.
Shaw, Wilfrid G.; Milberger, Ernest C.; and Dolhyj, Serge R., to Standard Oil Company (Ohio), The. Catalysts for producing unsaturated aliphatic acids. 4,250,054, Cl. 252-437.000.
Sheehan, Jerry D.; and Scheier, Donald J., to Simon-Johnson, Inc. Poultry killing method and machine. 4,249,285, Cl. 17-52.000.
Shell Internationale Research Maatschappij B.V.: *See*—
Haafkens, Rudolf; Luque, Rafael F.; and De Vries, Willem, 4,249,609, Cl. 166-280.000.
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Ewins, Earle E., Jr.; and Cocker, Jr., deceased; Geroge T., 4,250,272, Cl. 525-89.000.
Searle, Robert J. G.; and Day, Janet A., 4,249,936, Cl. 71-95.000.
Zijlstra, Kornelis N., 4,249,611, Cl. 166-367.000.
Shepard, Joseph F.: *See*—
Gardiner, James R.; Pliskin, William A.; Revitz, Martin; and Shepard, Joseph F., 4,249,968, Cl. 148-174.000.
Shepard, Steve A.: *See*—
Haag, George A.; Fogg, Douglas; Greenley, Gordon A.; Shepard, Steve A.; and Terry, F. Duncan, 4,250,562, Cl. 364-900.000.
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Mitchell, Richard A.; Nelson, Hoyt H.; and Sherman, Donald R., 4,250,555, Cl. 364-571.000.
Sherwin, Martin B.; Peress, Jimmy Y.; and Gwozdz, Kenneth J., to Chem Systems Inc. Cracking process for styrene. 4,250,344, Cl. 585-437.000.
Shibata, Toshihiro: *See*—
Nakahara, Yutaka; Kubota, Naohiro; and Shibata, Toshihiro, 4,250,312, Cl. 546-19.000.
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Shibuya, Masami: *See*—
Iwataki, Isao; Shibuya, Masami; Ishikawa, Hisao; and Kawana, Takashi, 4,249,937, Cl. 71-97.000.
Shigeta, Masayuki: *See*—
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Shimada, Keizo: *See*—
Tamura, Yorikazu; Aoki, Akihiro; Mera, Hiroshi; and Shimada, Keizo, 4,250,073, Cl. 260-32.6NA.
Shimada, Masaru; Maruyama, Shoji; and Tamura, Hiroshi, to Ricoh Company, Ltd. Photosensitive material for use in electrophotography. 4,250,240, Cl. 430-66.000.
Shimanaka, Hiroshi: *See*—
Ichida, Toshio; Komatsubara, Michiro; and Shimanaka, Hiroshi, 4,249,966, Cl. 148-113.000.
Shimano Industrial Company, Limited: *See*—
Hotta, Masashi, 4,249,392, Cl. 62-457.000.
Shimazaki, Ryuji; and Satoh, Yoji, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Nippon Soken, Inc. Air-fuel ratio feedback control apparatus of an internal combustion engine. 4,249,496, Cl. 123-438.000.
Shimizu, Masamichi: *See*—
Takahashi, Nobuo; Shimizu, Masamichi; Hirao, Kazushige; and Matsui, Sadayoshi, 4,250,156, Cl. 423-416.000.
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Sento, Hiroshi; Tanabe, Shoji; Shimozu, Tadao; Yamashita, Seiji; and Miyashita, Kunio, 4,250,424, Cl. 310-261.000.

Shimshick, Edward J., to Du Pont de Nemours, E. I., and Company. Removal of organic acids from dilute aqueous solutions of salts of organic acids by supercritical fluids. 4,250,331, Cl. 562-485.000.

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Kimura, Morihiro; Yamamoto, Kenji; and Nose, Masahiko, 4,249,680, Cl. 222-598.000.

Shindelar, Aloysius C.; and Deere & Company. Self-relieving fluid coupling. 4,249,572, Cl. 137-614.040.

Shinmyo, Saburo; and Tan, Yoichi, to Nippon Electric Co., Ltd. Device for demodulating PSK-FM double modulated carrier signals. 4,250,456, Cl. 329-50.000.

Shionogi & Co., Ltd.: *See—*
Maekawa, Hideyuki; Takagishi, Yasushi; and Kato, Hiroshi, 4,250,166, Cl. 424-81.000.

Shioya, Toshio; Ishii, Kiyoshi; and Nishimura, Hiroyuki, to Honda Giken Kogyo Kabushiki Kaisha. Exhaust gas recirculation for engine. 4,249,490, Cl. 123-568.000.

Shioya, Toshio; Ishii, Kiyoshi; and Nishimura, Hiroyuki, to Honda Giken Kogyo Kabushiki Kaisha. Unitary assembly for control of EGR apparatus for engine. 4,249,504, Cl. 123-568.000.

Shipilov, Fedor D., administrator: *See—*
Kalmykov, Vladimir N.; Musiiko, Vitaly A.; Khlopkov, Leonid P.; Gashenko, Stanislav I.; Rogatkin, Alexandr A.; Silakov, Grigory I.; Shipilov, Viktor F., deceased; Skibina, Elena S., administrator; Shipilov, Gennady V., administrator; and Shipilov, Fedor D., administrator, 4,249,989, Cl. 159-10.000.

Shipilov, Gennady V., administrator: *See—*
Kalmykov, Vladimir N.; Musiiko, Vitaly A.; Khlopkov, Leonid P.; Gashenko, Stanislav I.; Rogatkin, Alexandr A.; Silakov, Grigory I.; Shipilov, Viktor F., deceased; Skibina, Elena S., administrator; Shipilov, Gennady V., administrator; and Shipilov, Fedor D., administrator, 4,249,989, Cl. 159-10.000.

Shipilov, Viktor F., deceased: *See—*
Kalmykov, Vladimir N.; Musiiko, Vitaly A.; Khlopkov, Leonid P.; Gashenko, Stanislav I.; Rogatkin, Alexandr A.; Silakov, Grigory I.; Shipilov, Viktor F., deceased; Skibina, Elena S., administrator; Shipilov, Gennady V., administrator; and Shipilov, Fedor D., administrator, 4,249,989, Cl. 159-10.000.

Shipley, Randall S., to Dow Chemical Company, The. Ultra high efficiency catalyst for polymerizing olefins. 4,250,286, Cl. 526-125.000.

Shirahata, Ryuji; Kitamoto, Tatsuji; Suzuki, Masaaki; and Amari, Hiroshi, to Fuji Photo Film Co., Ltd. Process for the production of a magnetic recording medium. 4,250,225, Cl. 428-336.000.

Shobert, Samuel M.; and Fish, Elson B., to Plas/Steel Products, Inc. Apparatus for fabricating improved fiber reinforced plastic rods having a smooth surface. 4,249,980, Cl. 156-441.000.

Shoff, Daniel J.: *See—*
Crain, Philip W.; Kelley, William J.; and Shoff, Daniel J., 4,249,339, Cl. 46-232.000.

Shreeve, Francesca M.: *See—*
Maries, Alan; and Shreeve, Francesca M., 4,250,277, Cl. 525-337.000.

Shuck, David L.; and Chien, Calvin C., to Wyoming Mineral Corporation. Method for optimal placement and orientation of wells for solution mining. 4,249,776, Cl. 299-4.000.

Shum, Lanson Y., to Westinghouse Electric Corp. Digital electric energy measuring circuit. 4,250,449, Cl. 324-142.000.

Shuster, Edward J.: *See—*
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,250,194, Cl. 426-3.000.
Sprecker, Mark A.; Sanders, James M.; Schreiber, William L.; Watkins, Hugh; Vinals, Joaquin F.; Shuster, Edward J.; O'Rourke, Thomas J.; Hagedorn, Myrna L.; and Klemarczyk, Philip, 4,250,338, Cl. 568-343.000.

Sid Richardson Carbon & Gasoline Co.: *See—*
Pobst, David F., Jr.; and Bailey, Jesse M., Jr., 4,250,145, Cl. 422-151.000.

Siegla, Donald C., to General Motors Corporation. Valve lift adjusting device. 4,249,488, Cl. 123-90.160.

Siemens Aktiengesellschaft: *See—*
Adolph, Erich; Bayrak, Unal; Prohl, Robert; Schmidt, Gerhard; and Stecker, Walter, 4,250,535, Cl. 361-335.000.
Blaschke, Felix, 4,250,559, Cl. 364-815.000.
Brendl, Rudolf; Finkenzeller, Johann; and Weiss, Karl, 4,250,389, Cl. 250-476.000.
Goser, Karl, 4,250,556, Cl. 364-600.000.
Grassl, Gerhard, 4,250,568, Cl. 365-149.000.
Haass, Adolf, 4,250,459, Cl. 330-145.000.
Heynisch, Hinrich, 4,250,430, Cl. 315-5.380.
Hohmann, Eugen, 4,250,439, Cl. 318-601.000.
Kattner, Erich; Rosenstock, Guetner; and Kern, Hans, 4,250,512, Cl. 346-140.00R.
Klauck, Bernd; and Wolff, Michael, 4,250,502, Cl. 340-728.000.
Kriedt, Hans, 4,250,411, Cl. 307-264.000.
Luderer, Gunter; Weinkauf, Burghard; and Liebetruth, Reiner, 4,250,385, Cl. 250-363.00S.
Montag, Bernhard, 4,250,249, Cl. 430-355.000.
Papendieck, Friedrich; Kerschner, Guenther; Verfuerth, Rolf-Peter; and Rabold, Juergen, 4,250,561, Cl. 364-900.000.
Pfeifer, Rolf, 4,250,386, Cl. 250-402.000.
Schreyer, Karlheinz; and Oberstein, Karla, 4,250,353, Cl. 179-5.00R.

Silakov, Grigory I.: *See—*
Kalmykov, Vladimir N.; Musiiko, Vitaly A.; Khlopkov, Leonid P.; Gashenko, Stanislav I.; Rogatkin, Alexandr A.; Silakov, Grigory I.; Shipilov, Viktor F., deceased; Skibina, Elena S., administrator; Shipilov, Gennady V., administrator; and Shipilov, Fedor D., administrator, 4,249,989, Cl. 159-10.000.

Sillars, Frederick S., to USM Corporation. Horn for can body soldering. 4,249,692, Cl. 228-15.100.

Simon-Johnson, Inc.: *See—*
Sheehan, Jerry D.; and Scheier, Donald J., 4,249,285, Cl. 17-52.000.

Simon, Robert L.: *See—*
Coon, Clifford L.; and Simon, Robert L., 4,250,334, Cl. 568-683.000.

Simon, Walter: *See—*
Krabbe, Wilfried; and Simon, Walter, 4,249,870, Cl. 425-63.000.

Simpson, Danny E.: *See—*
Chase, Richard A.; Williams, D. Michael; and Simpson, Danny E., 4,249,333, Cl. 46-1.00R.

Sincerbox, Glenn T.; and Gordon, Joseph G., II, to International Business Machines Corporation. Projection display device. 4,249,796, Cl. 350-370.000.

Singer Company, The: *See—*
Beckerman, Howard L.; and Dob, Allan M., 4,250,495, Cl. 340-365.00C.
Herron, William L.; and Odermann, Charles R., 4,249,428, Cl. 74-569.000.
Weissman, Adrian, 4,250,436, Cl. 318-245.000.

Sircar, Shivaji; and Kratz, Wilbur C., to Air Products and Chemicals, Inc. Removal of water and carbon dioxide from air. 4,249,915, Cl. 55-26.000.

Sirel, Michel, to Les Cables de Lyon. Method of manufacturing a circular wave guide and installing the same. 4,249,300, Cl. 29-600.000.

Skala, Josef: *See—*
Vecera, Milos; and Skala, Josef, 4,249,370, Cl. 57-301.000.

SKF Kugellagerfabriken GmbH: *See—*
Olschewski, Armin; Kunkel, Heinrich; Brandenstein, Manfred; and Walter, Lothar, 4,249,781, Cl. 308-8.200.

Skibina, Elena S., administrator: *See—*
Kalmykov, Vladimir N.; Musiiko, Vitaly A.; Khlopkov, Leonid P.; Gashenko, Stanislav I.; Rogatkin, Alexandr A.; Silakov, Grigory I.; Shipilov, Viktor F., deceased; Skibina, Elena S., administrator; Shipilov, Gennady V., administrator; and Shipilov, Fedor D., administrator, 4,249,989, Cl. 159-10.000.

Skidmore, Peter R.: *See—*
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Skogen, Haven S., to Occidental Oil Shale, Inc. Doping a retort with radioactive nuclides to determine the locus of a processing zone. 4,249,603, Cl. 166-251.000.

Slade, Paul G.: *See—*
Kimblin, Clive W.; Holmes, Francis A.; Heberlein, Joachim V. R.; Gorman, Joseph G.; and Slade, Paul G., 4,250,364, Cl. 200-144.00B.

Slagle, Glenn B., to Cordless Power Corporation. Magnetic induction imaging system. 4,250,451, Cl. 324-239.000.

Slater, Frank W.; and Fuqua, Dale. Secondary recovery method and system using solar energy and concentric tank separator. 4,249,605, Cl. 166-266.000.

Sloan, Albert H. Control means for preventing water overflow into vacuum type priming pump. 4,249,865, Cl. 417-200.000.

Slurry Systems, Inc.: *See—*
Schmednecht, Fred C., 4,249,836, Cl. 405-267.000.

Smith, Clay D.; and Keller, Douglas V., Jr., to Otisca Industries, Ltd. Coal recovery processes utilizing agglomeration and density differential separations. 4,249,699, Cl. 241-20.000.

Smith, Clinton R.: *See—*
Coupland, Keith; and Smith, Clinton R., 4,250,045, Cl. 252-32.70E.

Smith, Daniel J.: *See—*
Taubman, Martin A.; and Smith, Daniel J., 4,250,262, Cl. 435-193.000.

Smith, George H., to Minnesota Mining and Manufacturing Company. Sensitized aromatic iodonium or aromatic sulfonium salt photoinitiator systems. 4,250,053, Cl. 252-426.000.

Smith International, Inc.: *See—*
Espana, Salvador, 4,249,621, Cl. 175-227.000.

Smith, Lawrence A., Jr., to Chemical Research & Licensing Company. Catalyst structure and a process for its preparation. 4,250,052, Cl. 252-426.000.

Smith, Neil C.; and Scrutchfield, Donald H., to Valmont Industries, Inc. End gun sequencing apparatus and method. 4,249,698, Cl. 239-1.000.

Smith, Otto J. M.: *See—*
Smith, Phyllis S.; and Smith, Otto J. M., 4,249,386, Cl. 60-693.000.

Smith, Phyllis S.; and Smith, Otto J. M. Apparatus for providing radiative heat rejection from a working fluid used in a Rankine cycle type system. 4,249,386, Cl. 60-693.000.

Smith, Richard L.; and Van Allen, Kent, to Scans Associates, Inc. Method of controlling production processes and apparatus therefor. 4,250,543, Cl. 364-105.000.

Smith, Thomas H.: *See—*
Wu, Helen Y.; Smith, Thomas H.; and Henry, David W., 4,250,303, Cl. 536-17.00A.

Smith, Warren F., Jr.: *See—*
Shapiro, Eugene; Vitek, John M.; and Smith, Warren F., Jr., 4,249,942, Cl. 75-157.500.

Smith, William C.: *See—*
Haug, Edward W.; and Smith, William C., 4,250,371, Cl. 219-69.00W.

Smith, William J.: *See—*
Villeneuve, Norman R.; and Smith, William J., 4,249,435, Cl. 81-477.000.

Smol, Robert: *See—*
Yang, Ralph T.; Smol, Robert; Farber, Gerald; and Naphtali, Leonard M., 4,250,015, Cl. 208-10.000.

Smolka, Heinz G.; and Koppelmann, Edgar, to Henkel Kommanditgesellschaft auf Aktien. Process for the preparation of alumino-silicate granulates. 4,249,903, Cl. 8-137.000.

Snamprogetti S.p.A.: *See—*
Renzi, Pierluigi; and Baroncelli, Vittorio, 4,250,253, Cl. 435-7.000.

SNIA VISCOSA Societa Nazionale Industria Applicazioni Viscosa S.p.A.: *See—*
Corrado, Giovanni; and Sopino, Bruno, 4,250,295, Cl. 528-272.000.

Snoy, Joseph B.; and Preston, Richard D., to Twin Disc, Incorporated. Friction clutch having a centrifugally actuated hydraulic control valve. 4,249,647, Cl. 192-103.0FA.

Snyderman, Fredric. Inflatable sailboat. 4,249,276, Cl. 9-2.00A.

Soares, Paul; and Stanley, Henry J., to Vacu•Blast Corporation. Glass bead separator. 4,250,024, Cl. 209-10.000.

Sobel, Jay E.; and Brand, Vincent T., to UOP Inc. Refractory inorganic oxide fibers. 4,250,131, Cl. 264-56.000.

Sobky, Reda Z. Automatic moist pet food server. 4,249,483, Cl. 119-51.120.

Societe Anonyme Automobiles Citroen: *See—*
Froumajou, Armand, 4,249,753, Cl. 280-673.000.
Level, Jean-Paul; and Buffard, Guy, 4,249,645, Cl. 188-322.000.

Societe Anonyme DBA: *See—*
Kervagoret, Gilbert, 4,249,455, Cl. 91-383.000.

S.A. Redco: *See—*
Baes, Emile; Navez, Jean-Pierre; and Della Faille de Leverghem, Marc, 4,249,991, Cl. 162-152.000.

Societe d'Optique, Precision Electronique et Mecanique Sopelem: *See—*
Moirez, Jacques, 4,249,792, Cl. 350-16.000.

Societe Francaise des Produits pour Catalyse: *See—*
Le Page, Jean-Francois; Martino, Germain; and Miquel, Jean, 4,250,056, Cl. 252-441.000.

Societe pour l'Equipement de Vehicules: *See—*
Guipaud, Serge C., 4,249,494, Cl. 123-425.000.

Sogo Pharmaceutical Company Limited: *See—*
Uchikuga, Saburo; Itoh, Michiro; and Nagahama, Katsuyasu, 4,250,109, Cl. 564-104.000.

Solartron Electronic Group Limited, The: *See—*
Dorey, Howard A.; Martin, Edward A.; and Spooner, Michael I., 4,250,407, Cl. 307-209.000.

Solbakken, Age; Apffel, Fred P.; Robinson, Sam P.; and Hayes, Bobby L., to Intenco, Inc. Process for recovering carbon black and hydrocarbons from used tires. 4,250,158, Cl. 423-449.000.

Solco Basel AG: *See—*
de Schrijver, Marc, 4,250,161, Cl. 424-1.000.

Solid Photography Inc.: *See—*
DiMatteo, Paul; and Stern, Howard K., 4,249,827, Cl. 356-402.000.

Solvay & Cie: *See—*
Delbouille, Andre; and Derroitte, Jean L., 4,250,284, Cl. 526-124.000.
Hubert, Guy; and Dechenne, Roger, 4,249,666, Cl. 215-1.00C.

Somat Corporation: *See—*
Miller, Blaine M., Jr., 4,249,701, Cl. 241-46.170.

Sommer, Hans: *See—*
Lask, Helmut; Holst, Arno; Nischwitz, Ehrenfried; and Sommer, Hans, 4,250,306, Cl. 536-88.000.

Sommer, Klaus; and Schoebel, Gottfried, to Benckiser-Knapsack GmbH. N-(Sulfoalkane) amino alkane phosphonic acids and their water-soluble salts. 4,250,107, Cl. 260-502.500.

Sommer, Neithart; Nordsiek, Karl-Heinz; and Ehrlich, Jurgen, to Chemische Werke Huls Aktiengesellschaft. Process for the preparation of a pulverulent filled rubber. 4,250,082, Cl. 260-42.550.

Sony Corporation: *See—*
Hashimoto, Yoshitaka, 4,250,472, Cl. 333-166.000.
Kubota, Shigeo; Kurousu, Asao; and Hayakawa, Shozaburo, 4,250,467, Cl. 331-94.50D.

Sopino, Bruno: *See—*
Corrado, Giovanni; and Sopino, Bruno, 4,250,295, Cl. 528-272.000.

Sotheran, Arthur; and Parnell, David H., to Rolls-Royce Ltd. Gas turbine engine. 4,249,373, Cl. 60-39.360.

Soundesign Corporation: *See—*
Roegner, George P.; Hawley, Richard; Steen, Howard; and Biener, Sig, 4,250,537, Cl. 362-86.000.

Southern California Gas Company: *See—*
Elkins, Robert H.; Durkin, Gary M.; and Macriss, Robert A., 4,249,594, Cl. 165-104.00F.

Southgate, Roger E., to Fieldtech Limited. Audio chime-signal generating circuit. 4,250,496, Cl. 340-384.00E.

Spanel, Abram N.: *See—*
Barth, Harry J., 4,249,972, Cl. 156-165.000.

Spector, George: *See—*
Polansky, Herbert; and Spector, George, 4,249,532, Cl. 128-287.000.

Speechley, Richard E.: *See—*
Connolly, John R.; Gibson, David E.; Heimark, Edward L.; Quinn, Jerome B.; Speechley, Richard E.; and Winter, Richard L., 4,249,863, Cl. 416-185.000.

Spence, John R., to Rockwell International Corporation. Clock pulse amplifier and clipper. 4,250,408, Cl. 307-237.000.

Sperry Corporation: *See—*
Cosimini, Gregory J.; Johnson, Leslie H.; Lo, David S.; Nelson, George F.; and Paul, Maynard C., 4,250,565, Cl. 365-87.000.
McCammon, William W., 4,250,442, Cl. 318-723.000.
Rowland-Hill, Edward W., 4,249,543, Cl. 130-27.00T.

Spies, Klaus, to Heintzman GmbH & Co. Method of and apparatus for supporting an overburden. 4,249,837, Cl. 405-290.000.

Spooner, Michael I.: *See—*
Dorey, Howard A.; Martin, Edward A.; and Spooner, Michael I., 4,250,407, Cl. 307-209.000.

Sprecker, Mark A.; Sanders, James M.; Schreiber, William L.; Watkins, Hugh; Vinals, Joaquin F.; Shuster, Edward J.; O'Rourke, Thomas J.; Hagedorn, Myrna L.; and Klemarczyk, Philip, to International Flavors & Fragrances Inc. Bridged ketones and process for preparing same. 4,250,338, Cl. 568-343.000.

Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, to International Flavors & Fragrances Inc. 2-Oxabicyclooctane derivatives, processes for preparing same and organoleptic uses thereof. 4,250,342, Cl. 568-826.000.

Sprecker, Mark A.: *See—*
Wiegers, Wilhelmus J.; Sprecker, Mark A.; Watkins, Hugh; Vock, Manfred H.; and Schmitt, Frederick L., 4,250,200, Cl. 426-536.000.

Springhurst Technologies Corp.: *See—*
Cunningham, Donald F., 4,249,867, Cl. 417-334.000.

Spruijt, Aloysius M. J. M., to U.S. Philips Corporation. Display device. 4,249,800, Cl. 350-320.000.

SRI International: *See—*
Wu, Helen Y.; Smith, Thomas H.; and Henry, David W., 4,250,303, Cl. 536-17.00A.

Srinivasan, Seshadri: *See—*
Greene, Neil E.; and Srinivasan, Seshadri, 4,249,398, Cl. 65-1.000.

Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Hoefke, Wolfgang; Gaida, Wolfram; and Pichler, Ludwig, to Boehringer Ingelheim GmbH. Method of slowing heart rate. 4,250,186, Cl. 424-273.00R.

Stahlmann, Willi: *See—*
Krukemeier, Richard; Merten, Uwe; and Stahlmann, Willi, 4,249,651, Cl. 198-509.000.

Stahura, Richard, to Martin Engineering. Belt cleaner mounting arrangement. 4,249,650, Cl. 198-499.000.

Stalder, Herbert, to Rieter Machine Works Ltd. Fiber sliver opening roll for an open-end spinning device. 4,249,286, Cl. 19-97.000.

Stamicarbon, B.V.: *See—*
van de Mond, Theodorus J.; and Delahaye, Hubertus J. A., 4,250,118, Cl. 568-338.000.

Standard Oil Company (Ohio), The: *See—*
Pesa, Frederick A.; and Graham, Anne M., 4,250,093, Cl. 260-239.30A.
Shaw, Wilfrid G.; Milberger, Ernest C.; and Dolhyj, Serge R., 4,250,054, Cl. 252-437.000.

Standun, Inc.: *See—*
Crago, Terril M.; and Olsen, Frederick C., 4,249,410, Cl. 72-347.000.

Stanfield, James S. Pressure roller for apparatus useful in repairing sprocket holes on strip material. 4,249,985, Cl. 156-554.000.

Stanley, Henry J.: *See—*
Soares, Paul; and Stanley, Henry J., 4,250,024, Cl. 209-10.000.

Stanzione, Daniel C.: *See—*
Blahut, Donald E.; Copp, David H.; and Stanzione, Daniel C., 4,250,545, Cl. 364-200.000.

Starell, Karl-Erik: *See—*
Kallaes, Elis; and Starell, Karl-Erik, 4,249,840, Cl. 410-81.000.

Stark, Virgil, to North American Utility Construction Corp. Solar energy collection. 4,249,516, Cl. 126-439.000.

STAS Societe Technique d'Accessoires Specialises: *See—*
Archer, Jean F., 4,249,474, Cl. 116-212.000.

Stauffer Chemical Company: *See—*
Gaughan, Edmund J., 4,250,185, Cl. 424-273.00P.
Kuck, Mark A.; Miller, Gary K.; and Coll-Palagos, Miguel, 4,250,000, Cl. 204-59.0QM.
Teach, Eugene G., 4,249,931, Cl. 71-88.000.
Teach, Eugene G., 4,249,932, Cl. 71-88.000.

Stecker, Walter: *See—*
Adolph, Erich; Bayrak, Unal; Prohl, Robert; Schmidt, Gerhard; and Stecker, Walter, 4,250,535, Cl. 361-335.000.

Steckler, Steven A.; and Balaban, Alvin R., to RCA Corporation. Television horizontal AFPC with phase detector driven at twice the horizontal frequency. 4,250,525, Cl. 358-148.000.

Steel, Gordon H.; and Mitchell, Graham, to Brico Engineering, Co., Ltd. Apparatus for measurement of compressive loads. 4,249,415, Cl. 73-120.000.

Steen, Howard: *See—*
Roegner, George P.; Hawley, Richard; Steen, Howard; and Biener, Sig, 4,250,537, Cl. 362-86.000.

Stegelitz, Wilhelmus J.; and Bernreiter, George P., to Dominion Engineering Works Limited. Adjustable bearing system for paper machine. 4,249,993, Cl. 162-381.000.

Stein, John, to Kim Hotstart Manufacturing Co., Inc. Multiple liquid heating and circulating system. 4,249,491, Cl. 123-142.50R.

Stein, William W.; and Burns, Robert W., to Tektronix, Inc. Thermal transfer color printer. 4,250,511, Cl. 346-76.0PH.

Steinbach, Robert L., to Chicago Lock Co. Keeper lock for a slide fastener. 4,249,402, Cl. 70-68.000.

Stengel, Edgar: *See—*
Reinke, Friedhelm; and Stengel, Edgar, 4,249,724, Cl. 266-261.000.

Stephens, Craig P.; and Rill, James C., to Hughes Aircraft Company. Edge-around leads for backside connections to silicon circuit die. 4,249,299, Cl. 29-578.000.
Stern Electronics, Inc.: *See*—
Rosenthal, Martin B., 4,249,736, Cl. 273-127.00R.
Stern, Howard K.: *See*—
DiMatteo, Paul; and Stern, Howard K., 4,249,827, Cl. 356-402.000.
Stevens, Keith D.: *See*—
Morton, John; and Stevens, Keith D., 4,250,437, Cl. 318-357.000.
Stock, Gunter: *See*—
Weyand, Karl; and Stock, Gunter, 4,249,720, Cl. 266-104.000.
Stohrer, Kurt. Spring hinge for spectacles. 4,249,804, Cl. 351-121.000.
Stork, Gilbert: *See*—
Wilson, Richard A.; Schreiber, William L.; Mookherjee, Braja D.; Kiwala, Jacob; Vinals, Joaquin F.; Vock, Manfred H.; Stork, Gilbert; and Schmitt, Frederick L., 4,250,049, Cl. 252-174.110.
Strack, Hans: *See*—
Bode, Rudolf; Reisert, Arthur; Turk, Gunter; and Strack, Hans, 4,250,081, Cl. 260-42.460.
Straubel, Max: *See*—
Eheim, Franz; and Straubel, Max, 4,249,497, Cl. 123-446.000.
Straus, Harry W.: *See*—
Leask, John W.; Leask, John C.; and Straus, Harry W., 4,250,392, Cl. 250-505.000.
Strausfeld, Hermann; Schloesser, Herbert; and Dehn, Dietmar, to EMI Electrola Gesellschaft mit beschrankter Haftung. Control of plastics extrusion. 4,249,876, Cl. 425-145.000.
Streich, Steven G.; Knox, L. Carter; and Sullaway, Bob L., to Halliburton Company. Retrievable plug for offshore platforms having shear type retaining means. 4,249,576, Cl. 138-89.000.
Strobel, Rudolf F.: *See*—
DeCaro, Aristide R.; and Strobel, Rudolf F., 4,249,887, Cl. 431-365.000.
Strongin, Grigory M.: *See*—
Efimov, Alexei V.; Berlin, Alfred A.; Kefeli, Tamara Y.; Varlamova, Nina V.; Strongin, Grigory M.; Altshuler, Judif M.; and Kolomazov, Boris I., 4,250,322, Cl. 560-26.000.
Structural Instrumentation, Inc.: *See*—
McCauley, Jerry L., 4,249,623, Cl. 177-136.000.
Struger, Odo J., to Allen-Bradley Company. Expandable programmable controller. 4,250,563, Cl. 364-900.000.
Studievic, Claude; Brossard, Guy; and Yribarren, Philippe, to Laboratoires Biotrol S.A. Method and device for analyzing and measuring out constituents of solid or liquid media. 4,249,826, Cl. 356-244.000.
Sturtz, John V., to Johns-Manville Corporation. Apparatus for chopping strand. 4,249,441, Cl. 83-347.000.
Su Sheih, Pong: *See*—
Bertram, James L.; and Su Sheih, Pong, 4,250,100, Cl. 260-348.140.
Sudler, Roland; and Reiferscheid, Norbert, to Quarz-Zeit AG. Electric clock. 4,250,576, Cl. 368-323.000.
Suemitsu, Masayasu: *See*—
Katayama, Mitsumasa; and Suemitsu, Masayasu, 4,249,668, Cl. 220-2.10R.
Sugarman, Joseph. Particulate collector apparatus and method for ion generators. 4,250,431, Cl. 315-111.900.
Sugasawa, Fukashi; Iizuka, Haruhiko; Matsumoto, Junichiro; and Etoh, Yukihiro, to Nissan Motor Company, Limited. Split engine control system with exhaust gas recirculation. 4,249,374, Cl. 60-276.000.
Sullaway, Bob L.: *See*—
Streich, Steven G.; Knox, L. Carter; and Sullaway, Bob L., 4,249,576, Cl. 138-89.000.
Sulzer Brothers Limited: *See*—
Bahler, Andre; Gschwend, Norbert; and Scheier, Heinrich, 4,249,270, Cl. 3-1.911.
Baumann, Hans; and Bader, Hartmann, 4,249,579, Cl. 139-92.000.
Sumida, Seizo: *See*—
Takemoto, Ichiki; Sumida, Seizo; Yoshida, Ryo; and Kamoshita, Katsuzo, 4,249,938, Cl. 71-98.000.
Sumida, Shizuo, to Toyo Kogyo Co., Ltd. Data input device. 4,250,401, Cl. 235-92.0DE.
Sumitomo Chemical Company, Limited: *See*—
Takemoto, Ichiki; Sumida, Seizo; Yoshida, Ryo; and Kamoshita, Katsuzo, 4,249,938, Cl. 71-98.000.
Sumitomo Electric Industries, Ltd.: *See*—
Okita, Koichi, 4,250,138, Cl. 264-568.000.
Sumitomo Kinzoku Kogyo Kabushiki Gaisha: *See*—
Tani, Takayuki, 4,250,372, Cl. 219-121.0LE.
Tani, Takayuki, 4,250,374, Cl. 219-121.0LE.
Sumitomo Metal Industries, Ltd.: *See*—
Tsuda, Tetsuaki; and Kurimoto, Tatsuo, 4,249,999, Cl. 204-28.000.
Summerer, Gunther: *See*—
Muchel, Franz; and Summerer, Gunther, 4,249,802, Cl. 351-7.000.
Sun, Jui-Yuan: *See*—
Masologites, George P.; Sun, Jui-Yuan; Yoo, Jin S.; and Burk, Emmett H., Jr., 4,249,910, Cl. 44-1.0SR.
Sunday, Brooks R.: *See*—
Schwender, Charles F.; and Sunday, Brooks R., 4,250,177, Cl. 424-250.000.
Sundstrand Corporation: *See*—
Linscott, Phillip S., Jr., 4,250,423, Cl. 310-258.000.
Sunnen Products Company: *See*—
Rutter, Harold T., 4,249,348, Cl. 51-338.000.
Surmiak, Stanislaw: *See*—
Bambuch, Tadeusz; Wilusz, Henryk; Englert, Wieslaw; Czank, Stanislaw; and Surmiak, Stanislaw, 4,249,964, Cl. 148-16.500.
Suzuki, Kazuo: *See*—
Kotani, Teizo; Matsumoto, Shuichi; Igarashi, Katsutoshi; and Suzuki, Kazuo, 4,250,063, Cl. 260-4.00R.
Suzuki, Masaaki: *See*—
Shirahata, Ryuji; Kitamoto, Tatsuji; Suzuki, Masaaki; and Amari, Hiroshi, 4,250,225, Cl. 428-336.000.
Suzuki, Masayuki; Ito, Tadashi; Yamamichi, Masayoshi; and Murakami, Hiroyasu, to Canon Kabushiki Kaisha. Photographic camera with a release locking device. 4,249,816, Cl. 354-266.000.
Suzuki, Seiichi: *See*—
Wakabayashi, Osamu; Matsuya, Kuni; Ohta, Hiroki; Jikihara, Tetsuo; and Suzuki, Seiichi, 4,249,934, Cl. 71-92.000.
Suzuki, Takeshi; Furukawa, Yasuyoshi; Tomoda, Masayasu; Ueta, Yutaka; and Ohmori, Akira, to Daikin Kogyo Co., Ltd. Fluorinated rubber composition. 4,250,278, Cl. 525-340.000.
Suzuki, Yoshiki: *See*—
Nagai, Tsuneji; Machida, Yoshiharu; Suzuki, Yoshiki; and Ikura, Hiroshi, 4,250,163, Cl. 424-14.000.
Svensson, Gustav E. Device to automatically activate or deactivate control means. 4,250,360, Cl. 200-82.00C.
Swann, Wayne E.: *See*—
Hartdegen, Frank J.; and Swann, Wayne E., 4,250,267, Cl. 435-317.000.
Swanson, Sigurd A.: *See*—
Grab, George P.; Hood, Grant W., Jr.; Swanson, Sigurd A.; and Nemeth, Bela J., 4,249,955, Cl. 106-308.00Q.
Sweet, Randall P.: *See*—
Monroe, Carl M.; and Sweet, Randall P., 4,250,075, Cl. 260-33.6SB.
Swick, E. Grant: *See*—
Hammer, Victor S., Jr.; and Swick, E. Grant, 4,250,356, Cl. 179-146.00R.
Swiss Aluminium Ltd.: *See*—
Sandera, Ladislav, 4,250,213, Cl. 427-409.000.
Schlatter, Reinhard; and Grass, Arnold, 4,250,220, Cl. 428-212.000.
Syme, Duncan C., to Vermont Castings, Inc. Wood burning apparatus having improved efficiency. 4,249,509, Cl. 126-77.000.
Syntex (U.S.A.) Inc.: *See*—
Kerfoot, Frank W., Jr., 4,249,896, Cl. 433-132.000.
Pfister, Jurg R., 4,250,097, Cl. 260-335.000.
Syred, Nicholas; and Roberts, Peter J., to United Kingdom Atomic Energy Authority. Fluidic devices. 4,249,575, Cl. 137-812.000.
Systron-Donner Corporation: *See*—
Marquess, Richard D., 4,249,420, Cl. 73-516.00R.
Szarka, Laszlo J.; and Eltz, Robert W., to E. R. Squibb & Sons, Inc. Use of phenoxyalkanes as precursors in penicillin V fermentation. 4,250,258, Cl. 435-45.000.
Szarvas, George G., to Communications Satellite Corporation. Syllabic compander with logarithmic chain. 4,250,470, Cl. 333-14.000.
Szego, Andrew, to Explosafe America Inc. Containers and other liquid-holding means. 4,249,669, Cl. 220-216.000.
Szporny, Laszlo: *See*—
Felfoldi, Karoly; Apjok, Jozsef; Bartok, Mihaly; Czombos, Jozsef; Molnar, Arpad; Noteisz, Ferenc; Karpati, Egon; and Szporny, Laszlo, 4,250,310, Cl. 544-379.000.
Tada, Yasuo, to Mitsubishi Denki Kabushiki Kaisha. Ignition device for internal combustion engine. 4,249,506, Cl. 123-618.000.
Tadanier, John S.: *See*—
Martin, Jerry R.; Tadanier, John S.; Johnson, Paulette; and Nadzan, Alex M., 4,250,304, Cl. 536-17.00R.
Tadd, Roy W. Tab buckle. 4,249,287, Cl. 24-113.00R.
Tagima, Fumio: *See*—
Tahara, Kazuo; Tagima, Fumio; Motegi, Shoji; and Saito, Shigeki, 4,250,422, Cl. 310-227.000.
Tahara, Kazuo; Tagima, Fumio; Motegi, Shoji; and Saito, Shigeki, to Agency of Industrial Science and Technology. Cooling means for electrical rotating machine. 4,250,422, Cl. 310-227.000.
Takada, Juichiro. Input motion coupling to a motion amplifier for use in passive seat belt restraint systems. 4,249,755, Cl. 280-804.000.
Takagishi, Yasushi: *See*—
Maekawa, Hideyuki; Takagishi, Yasushi; and Kato, Hiroshi, 4,250,166, Cl. 424-81.000.
Takahashi, Hisashi; Hanai, Satoshi; and Yoshida, Katsuyoshi, to Nippon Steel Corporation. Method for applying coating of molten metals. 4,250,207, Cl. 427-211.000.
Takahashi, Katsuhiro; Muraki, Shigeru; and Yoshida, Toshio, to Takasago Perfumery Co., Ltd. 4-Hydroxy-4-methyl-cyclohexen-2-one-1. 4,250,117, Cl. 568-377.000.
Takahashi, Kousuke, to Nippon Electric Co., Ltd. Magnetic bubble driving device. 4,250,564, Cl. 365-6.000.
Takahashi, Nobuo; Shimizu, Masamichi; Hirao, Kazushige; and Matsui, Sadayoshi, to Ihara Chemical Industry Co., Ltd. Process for preparing carbonyl sulfide. 4,250,156, Cl. 423-416.000.
Takasago Perfumery Co., Ltd.: *See*—
Takahashi, Katsuhiro; Muraki, Shigeru; and Yoshida, Toshio, 4,250,117, Cl. 568-377.000.
Takemoto, Ichiki; Sumida, Seizo; Yoshida, Ryo; and Kamoshita, Katsuzo, to Sumitomo Chemical Company, Limited. N-Phenyl-N-methyl-urea derivatives, and their production and use. 4,249,938, Cl. 71-98.000.
Takenoshita, Mitsuaki; and Shigeta, Masayuki, to Hitachi, Ltd. Speed control system for hydraulic elevator. 4,249,641, Cl. 187-29.00A.
Tallerico, Peter, Jr. Coping tracing machine. 4,249,446, Cl. 83-789.000.
Talley, Billy D. Method of depressurizing a leached salt cavern. 4,249,833, Cl. 405-58.000.
Tallon, Roger, to Design Programmes. Floor covering. 4,250,218, Cl. 428-166.000.

Talyzin, Nikolai V.; Rozengauz, Solomon M.; Tikhonov, Vasily F.; and Mosolov, Nikolai K. Machine for sorting and retrieval of flat objects. 4,250,028, Cl. 209-583.000.

Tamagawa Kikai Kinzoku Kabushiki Kaisha: *See*—
Futatsuka, Rensei; and Sakakibara, Tadao, 4,249,941, Cl. 75-153.000.

Tamura Electric Works, Ltd.: *See*—
Yamamoto, Yukio; and Tezuka, Takeo, 4,250,404, Cl. 235-92.0FP.

Tamura, Hiroshi: *See*—
Shimada, Masaru; Maruyama, Shoji; and Tamura, Hiroshi, 4,250,240, Cl. 430-66.000.

Tamura, Nobuhiro: *See*—
Nishikido, Joji; Tamura, Nobuhiro; Fukuoka, Yohei; and Yamane, Hiroyuki, 4,250,110, Cl. 564-156.000.

Tamura, Yorikazu; Aoki, Akihiro; Mera, Hiroshi; and Shimada, Keizo, to Teijin Limited. Aromatic polyamide composition having polar amide and halogenated hydrocarbon mixed solvent. 4,250,073, Cl. 260-32.6NA.

Tan, Yoichi: *See*—
Shinmyo, Saburo; and Tan, Yoichi, 4,250,456, Cl. 329-50.000.

Tanabe, Shoji: *See*—
Sento, Hiroshi; Tanabe, Shoji; Shimozu, Tadao; Yamashita, Seiji; and Miyashita, Kunio, 4,250,424, Cl. 310-261.000.

Tanaka, Chiaki; Naito, Nagayoshi; and Furuta, Yoko, to Toray Industries, Inc. Thermoplastic blockcopolyetherester composition having improved thermal stability. 4,250,280, Cl. 525-437.000.

Tani, Takayuki, to Sumitomo Kinzoku Kogyo Kabushiki Gaisha. Process and apparatus for the heat treatment by high energy beams of surfaces of steel products. 4,250,372, Cl. 219-121.0LE.

Tani, Takayuki, to Sumitomo Kinzoku Kogyo Kabushiki Gaisha. Process and apparatus for the surface heat treatment of steel products by a laser beam. 4,250,374, Cl. 219-121.0LE.

Tanida, Hiroshi. Transferred type plasma torch. 4,250,373, Cl. 219-121.00P.

Tarancon, Gregorio, to Union Carbide Corporation. Sterilization gas separation process. 4,249,917, Cl. 55-48.000.

Tasaka, Motoo: *See*—
Tsubuko, Kazuo; Kimura, Taro; Tasaka, Motoo; and Hashimoto, Junichiro, 4,250,241, Cl. 430-114.000.

Task, Harry L., to United States of America, Air Force. Windscreen angular deviation measurement device. 4,249,823, Cl. 356-128.000.

Tatsumi, Hideo: *See*—
Kanamaru, Hisanobu; Tatsumi, Hideo; Okabe, Moisei; and Tohkairin, Akira, 4,249,298, Cl. 29-520.000.

Taubman, Martin A.; and Smith, Daniel J., to Forsyth Dental Infirmary for Children. Method of preparing a purified glucosyltransferase. 4,250,262, Cl. 435-193.000.

Taylor, Marshall W.: *See*—
Dobbs, Fred J.; Taylor, Marshall W.; and Gulley, Rinda S., 4,249,710, Cl. 242-199.000.

Taylor, Michael C., to Mackey, Thomas, a part interest. Cooling tower vapor recovery unit. 4,249,391, Cl. 62-304.000.

Taylor, Robert B.: *See*—
McFarlane, Finley E.; and Taylor, Robert B., 4,250,078, Cl. 260-40.00R.

Teach, Eugene G., to Stauffer Chemical Company. 5-Oxy or thiomethyl substituted oxazolidine herbicide antidotes. 4,249,931, Cl. 71-88.000.

Teach, Eugene G., to Stauffer Chemical Company. 5-Phenoxymethyl substituted oxazolidine herbicide antidotes. 4,249,932, Cl. 71-88.000.

Technicare Corporation: *See*—
Vilkomerson, David H. R.; Mezrich, Reuben S.; and Rubin, Carl S., 4,249,539, Cl. 128-660.000.

Technicon Instruments Corporation: *See*—
Lee, Martin J.; and Malin, Michael J., 4,250,257, Cl. 435-4.000.

Tecnomagnetica di Cardone, Grandini, Zaramella & C. S. a.s.: *See*—
Cardone, Michele; Grandini, Angelo; and Zaramella, Bruno, 4,250,478, Cl. 335-288.000.

Teijin Limited: *See*—
Nagai, Tsuneji; Machida, Yoshiharu; Suzuki, Yoshiki; and Ikura, Hiroshi, 4,250,163, Cl. 424-14.000.
Tamura, Yorikazu; Aoki, Akihiro; Mera, Hiroshi; and Shimada, Keizo, 4,250,073, Cl. 260-32.6NA.

Tektronix, Inc.: *See*—
Mutton, Jon C., 4,250,378, Cl. 250-221.000.
Stein, William W.; and Burns, Robert W., 4,250,511, Cl. 346-76.0PH.

Telefonaktiebolaget L M Ericsson: *See*—
Nilsson, Lars K., 4,250,453, Cl. 328-138.000.

Telex Computer Products, Inc.: *See*—
Foster, Raymond F., 4,250,463, Cl. 330-298.000.

Telles, Larry: *See*—
Colburn, Michael R., 4,249,296, Cl. 29-426.100.

Temmyo, Shigemoto: *See*—
Watanabe, Junichi; Koide, Hiroshi; and Temmyo, Shigemoto, 4,250,416, Cl. 310-13.000.

Tenchi Kikai Kabushiki Kaisha: *See*—
Kawasaki, Kaoru; and Umehara, Masakazu, 4,249,364, Cl. 53-550.000.

Tennison, Stephen R.: *See*—
Foster, Alan I.; James, Peter G.; McCarroll, John J.; and Tennison, Stephen R., 4,250,057, Cl. 252-447.000.

Tepper, Sidney: *See*—
Eddins, Fred D.; and Tepper, Sidney, 4,249,733, Cl. 273-86.00C.

Teramachi, Yasuaki: *See*—
Musha, Toshimitsu; Harumi, Kenichi; Teramachi, Yasuaki; and Kanou, Toshiyuki, 4,249,538, Cl. 128-630.000.

Terminal Data Corporation: *See*—
Rudy, Michael W.; Langford, Forrest L.; and Therien, Robert D., 4,249,821, Cl. 355-64.000.

Terry, F. Duncan: *See*—
Haag, George A.; Fogg, Douglas; Greenley, Gordon A.; Shepard, Steve A.; and Terry, F. Duncan, 4,250,562, Cl. 364-900.000.

Terry, Ruel C., to In Situ Technology, Inc. Generating electricity from coal in situ. 4,250,230, Cl. 429-12.000.

Tesch, Rodney C.: *See*—
Moench, Jerry D.; and Tesch, Rodney C., 4,250,410, Cl. 307-263.000.

Teske, Lothar. System for reclaiming bulk solids from a storage pile. 4,249,845, Cl. 414-133.000.

Tetenborg, Konrad; and Huwelmann, Helmut, to Windmoller & Holscher. Method of fully automatically filling and closing large sacks. 4,249,361, Cl. 53-415.000.

Teti, John J., to Pyott-Boone Machinery Corporation. Low profile fork lift for mine vehicles. 4,249,854, Cl. 414-685.000.

Texaco Development Corporation: *See*—
Burns, Robert B., 4,249,619, Cl. 175-9.000.

Texaco Inc.: *See*—
Allen, Joseph C., 4,249,607, Cl. 166-274.000.
Calderon, Reynaldo, 4,249,292, Cl. 29-163.5CW.
Carter, Walter H., 4,249,608, Cl. 166-275.000.
Estes, John H.; and Buinicky, Ernest P., 4,250,016, Cl. 208-11.0LE.
Frazier, Terry L., 4,249,604, Cl. 166-263.000.
Kalfoglou, George, 4,249,606, Cl. 166-273.000.

Texas Instruments Incorporated: *See*—
Bate, Robert T.; and Morris, Henry B., 4,250,206, Cl. 427-88.000.

Texas Utilities Services, Inc.: *See*—
Dick, David C.; and Hurt, James M., Jr., 4,249,916, Cl. 55-73.000.

Tezuka, Takeo: *See*—
Yamamoto, Yukio; and Tezuka, Takeo, 4,250,404, Cl. 235-92.0FP.

Thaxton, George H.: *See*—
Graham, Thomas E.; Thaxton, George H.; Mitchell, Francis M.; and Bell, Robert P., 4,250,226, Cl. 428-344.000.

Therien, Robert D.: *See*—
Rudy, Michael W.; Langford, Forrest L.; and Therien, Robert D., 4,249,821, Cl. 355-64.000.

Thermo Electron Corporation: *See*—
Rounbehler, David P.; and Reisch, John W., 4,249,904, Cl. 23-230.00M.

Thermo King Corporation: *See*—
Mayer, Donald K., 4,249,389, Cl. 62-192.000.

Thermonetics, Inc.: *See*—
Samis, James M.; and Waechter, Walter C., 4,250,023, Cl. 209-3.000.

Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Track working machine for distributing and shaping the ballast of a railroad bed. 4,249,325, Cl. 37-104.000.

Theurer, Josef; and Riessberger, Klaus, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile rail grinding machine and method. 4,249,346, Cl. 51-178.000.

Theurer, Josef; and Oellerer, Friedrich, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile apparatus for receiving and laying as assembled track switch or crossing section. 4,249,467, Cl. 104-3.000.

Thieffry, Luc, to "P.B.I." Procedes et Brevets Industriels. Process and installation for moulding paving stones or slabs. 4,249,358, Cl. 52-745.000.

Thiel, Klaus P.: *See*—
Briska, Marian; and Thiel, Klaus P., 4,249,970, Cl. 148-188.000.

Thiele, Norbert: *See*—
Koch, Friedrich; and Thiele, Norbert, 4,249,882, Cl. 425-547.000.

Thinesen, Tom: *See*—
Leitzel, William O.; and Thinesen, Tom, 4,250,539, Cl. 362-196.000.

Thomas & Betts Corporation: *See*—
Basile, Rocco F., 4,249,305, Cl. 30-164.900.
Weinmann, Karl; Kuo, Ted L. C.; and Greenwood, William S., 4,249,303, Cl. 29-868.000.
Weinmann, Karl; and Kuo, Ted L. C., 4,249,304, Cl. 29-872.000.

Thomas, Bradley S. Micropipette system. 4,249,419, Cl. 73-425.600.

Thomas, Neal F.: *See*—
Kouchich, Allan V.; Radosevich, Lawrence D.; Blanchard, John C.; and Thomas, Neal F., 4,250,482, Cl. 338-275.000.

Thompson, William L.: *See*—
Keyes, Marion A., IV; Malcolm, Jack W.; and Thompson, William L., 4,250,558, Cl. 364-607.000.

Thompson, William S., to Elkhart Brass Manufacturing Co., Inc. Seal for a liquid valve. 4,249,717, Cl. 251-210.000.

Thomson-CSF: *See*—
de Panafieu, Arnaud; Baylac, Christiane; Nemaud, Yves; Turpin, Marc; and Faure, Michel, 4,249,924, Cl. 65-2.000.

Thorsteinson, Erlind M.: *See*—
Young, Frank G.; and Thorsteinson, Erlind M., 4,250,346, Cl. 585-658.000.

Tikhonov, Vasily F.: *See*—
Talyzin, Nikolai V.; Rozengauz, Solomon M.; Tikhonov, Vasily F.; and Mosolov, Nikolai K., 4,250,028, Cl. 209-583.000.

Timex Corporation: *See*—
Flumm, Paul, 4,250,575, Cl. 368-227.000.

Tohkairin, Akira: *See—*
Kanamaru, Hisanobu; Tatsumi, Hideo; Okabe, Moisei; and Tohkairin, Akira, 4,249,298, Cl. 29-520.000.
Tokhadze, Joseph. Method and system of designing a project. 4,249,806, Cl. 353-30.000.
Tokuno, Masateru, to Rengo Co., Ltd. Apparatus for transporting boards. 4,249,847, Cl. 414-330.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Ebata, Yasuo, 4,249,418, Cl. 73-339.00A.
Tsutsumi, Tadashi; and Mizuguchi, Mamoru, 4,250,375, Cl. 219-216.000.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Gemba, Tomoji, 4,250,473, Cl. 333-193.000.
Sasaki, Masayuki; and Gotou, Shuichi, 4,250,370, Cl. 219-10.55B.
Tolman, Richard L.: *See—*
Bochis, Richard J.; Kulsa, Peter; and Tolman, Richard L., 4,250,174, Cl. 424-248.500.
Tomisawa, Norio, to Nippon Gakki Seizo Kabushiki Kaisha. Tone production method for an electronic musical instrument. 4,249,447, Cl. 84-1.010.
Tomizawa, Akimori, to Clarion Co., Ltd. Validation apparatus in a pay television system. 4,250,524, Cl. 358-122.000.
Tomoda, Masayasu: *See—*
Suzuki, Takeshi; Furukawa, Yasuyoshi; Tomoda, Masayasu; Ueta, Yutaka; and Ohmori, Akira, 4,250,278, Cl. 525-340.000.
Tonooka, Noriaki: *See—*
Ochiai, Michio; Tonooka, Noriaki; and Matubara, Kenkichi, 4,250,193, Cl. 424-358.000.
Toppan Printing Co., Ltd.: *See—*
Seki, Ikuo; and Kato, Masahiko, 4,250,522, Cl. 358-76.000.
Toray Industries, Inc.: *See—*
Tanaka, Chiaki; Naito, Nagayoshi; and Furuta, Yoko, 4,250,280, Cl. 525-437.000.
Townsend, Claude A., III. Fluorescent leak detection composition. 4,249,412, Cl. 73-40.700.
Toyo Kogyo Co., Ltd.: *See—*
Noso, Shizuma, 4,249,356, Cl. 52-717.000.
Sumida, Shizuo, 4,250,401, Cl. 235-92.0DE.
Toyo Soda Manufacturing Co., Ltd.: *See—*
Sakamoto, Teruhisa; Sekizawa, Kazuhiko; and Kihara, Keiichi, 4,250,339, Cl. 568-471.000.
Toyota, Akinori: *See—*
Minami, Syuji; Toyota, Akinori; and Kashiwa, Norio, 4,250,285, Cl. 526-125.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Shimazaki, Ryuji; and Satoh, Yoji, 4,249,496, Cl. 123-438.000.
Trainin, Nathan, to Yeda Research and Development Company Limited. Purified thymic hormone (THF), its preparation and pharmaceutical compositions containing it. 4,250,084, Cl. 260-112.00R.
Tran Quand, Dang: *See—*
Gabbay, Emile; Tran Quand, Dang; and Lafitte, Andre, 4,250,425, Cl. 313-60.000.
Trane Company, The: *See—*
Butt, Alan G., 4,249,595, Cl. 165-110.000.
Transamerica DeLaval Inc.: *See—*
Weiss, Paul D., 4,249,567, Cl. 137-512.000.
Trefilarbed S.A.: *See—*
Weyand, Karl; and Stock, Gunter, 4,249,720, Cl. 266-104.000.
Trenkle, Robert W.; Mookherjee, Braja D.; Hall, John B.; Kasper, Robin; Vock, Manfred H.; Schreck, Ronald; Granda, Edward J.; and Vinals, Joaquin F., to International Flavors & Fragrances Inc. Process for preparing acyl trimethyl cyclohexene derivatives and use of intermediates therefor in augmenting or enhancing the aroma or taste of a consumable material. 4,250,332, Cl. 568-347.000.
Trennjaeger Maschinenfabrik: *See—*
Jagers, Leopold, 4,249,443, Cl. 83-490.000.
Tretorn Aktiebolag: *See—*
Frisk, Lennart J. F., 4,249,730, Cl. 273-61.00C.
Trihey, John M., to Malz Nominees Pty. Ltd. Internal combustion engine and head thereof. 4,249,495, Cl. 123-432.000.
Triple Cuff Corporation: *See—*
Daleo, Joseph, 4,249,401, Cl. 70-16.000.
Triumph-Adler A.G.: *See—*
Link, Manfred; and Puch, Diethelm, 4,249,829, Cl. 400-144.200.
Troeger, Henry. Game apparatus and playing piece for use therewith. 4,249,738, Cl. 273-144.00B.
Trzaskos, Casmir R.: *See—*
Oliver, David W.; and Trzaskos, Casmir R., 4,250,428, Cl. 313-268.000.
Tsang, Frederick; Kannal, Gregory A.; and Hoff, Marcian E., Jr., to Intel Corporation. Redundant memory circuit. 4,250,570, Cl. 365-200.000.
Tseng, Hsin-fu, to Reticon Corporation. Charge transfer, tetrode bucket-brigade device. 4,250,517, Cl. 357-24.000.
Tsu, Raphael: *See—*
Esaki, Leo; Tsu, Raphael; Sai-Halasz, George A.; and Chang, Leroy L., 4,250,515, Cl. 357-16.000.
Tsubuko, Kazuo; Kimura, Taro; Tasaka, Motoo; and Hashimoto, Junichiro, to Ricoh Company, Ltd. Liquid developer for use in electrophotography. 4,250,241, Cl. 430-114.000.
Tsuda, Tetsuaki; and Kurimoto, Tatsuo, to Sumitomo Metal Industries, Ltd. Electrolytic zinc-nickel alloy plating. 4,249,999, Cl. 204-28.000.
Tsukada, Toshiro: *See—*
Kihara, Toshimasa; and Tsukada, Toshiro, 4,250,493, Cl. 340-347.0NT.
Tsukamoto, Nobuo: *See—*
Yamakido, Kazuo; and Tsukamoto, Nobuo, 4,250,492, Cl. 340-347.0DA.
Tsuno, Takashi: *See—*
Kawaguchi, Hiroshi; Konishi, Masataka; Tsuno, Takashi; and Miyaki, Takeo, 4,250,170, Cl. 424-181.000.
Tsutsumi, Tadashi; and Mizuguchi, Mamoru, to Tokyo Shibaura Denki Kabushiki Kaisha. Thermal recording head. 4,250,375, Cl. 219-216.000.
Tsuzuki, Kanemitsu; Motobayashi, Kozo; Watanabe, Kazuo; Kito, Yastami; and Seko, Shigeo, to Kabushiki Kaisha Toyoda Jidoh Shokki Seisakusho; and Kabushiki Kaisha Meidensha. Centralized control system for open end spinning machines. 4,249,369, Cl. 57-263.000.
Tsybukov, Igor K.: *See—*
Kaluzhsky, Nikolai A.; Gefter, Semen E.; Tsybukov, Igor K.; Evdokimov, Svetozar V.; Derkach, Alexei S.; Tsyplakov, Anatoly M.; Lankin, Valery P.; Velichko, Boris P.; Kostin, Albert A.; Volfson, Grigory E.; and Nikiforov, Vladimir P., 4,250,012, Cl. 204-243.00M.
Tsyplakov, Anatoly M.: *See—*
Kaluzhsky, Nikolai A.; Gefter, Semen E.; Tsybukov, Igor K.; Evdokimov, Svetozar V.; Derkach, Alexei S.; Tsyplakov, Anatoly M.; Lankin, Valery P.; Velichko, Boris P.; Kostin, Albert A.; Volfson, Grigory E.; and Nikiforov, Vladimir P., 4,250,012, Cl. 204-243.00M.
Tu, Hosheng, to UOP Inc. Catalytic composite, method of manufacture. 4,250,059, Cl. 252-455.00Z.
Turk, Gunter: *See—*
Bode, Rudolf; Reisert, Arthur; Turk, Gunter; and Strack, Hans, 4,250,081, Cl. 260-42.460.
Turner, James E.: *See—*
Babson, Arthur L.; and Turner, James E., 4,250,041, Cl. 252-1.000.
Turner, Nathan L.: *See—*
Click, Gaylon T.; Turner, Nathan L.; and Hoff, Edwin F., Jr., 4,250,083, Cl. 260-45.9QB.
Turpin, Marc: *See—*
de Panafieu, Arnaud; Baylac, Christiane; Nemaud, Yves; Turpin, Marc; and Faure, Michel, 4,249,924, Cl. 65-2.000.
Tutak, Peter; and Burk, Don. Condenser and method of construction. 4,249,596, Cl. 165-113.000.
Twin Disc, Incorporated: *See—*
Snoy, Joseph B.; and Preston, Richard D., 4,249,647, Cl. 192-103.0FA.
Tzikas, Athanassios, to Ciba-Geigy AG. Process for the manufacture of aminohydroxyanthraquinones. 4,250,102, Cl. 260-377.000.
Ube Industries, Ltd.: *See—*
Yasuno, Hiroshi; Yoshinaga, Toshimune; and Nakano, Tsunetomo, 4,250,007, Cl. 204-159.230.
Uberall, Herbert M.: *See—*
Gaunaurd, Guillermo C.; Uberall, Herbert M.; and Scharnhorst, Kurt P., 4,249,421, Cl. 73-589.000.
Gaunaurd, Guillermo C.; and Uberall, Herbert M., 4,249,422, Cl. 73-589.000.
Uchikuga, Saburo; Itoh, Michiro; and Nagahama, Katsuyasu, to Sogo Pharmaceutical Company Limited. Process for preparing hexamethylene bis-dicyandiamide. 4,250,109, Cl. 564-104.000.
Udo, Eiji, to Nikko Industry Co., Ltd. Apparatus for preheating material to be charged into steel making equipment. 4,249,721, Cl. 266-156.000.
Uehara, Makoto, to Nippon Kogaku K.K. Erect type zoom telescopic optical system. 4,249,793, Cl. 350-43.000.
Uejima, Hiroyuki; Hirai, Masahide; and Kazigase, Masahiro, to Unitika Ltd. Phenolic chelate resin and method of adsorption treatment. 4,250,031, Cl. 210-688.000.
Ueta, Yutaka: *See—*
Suzuki, Takeshi; Furukawa, Yasuyoshi; Tomoda, Masayasu; Ueta, Yutaka; and Ohmori, Akira, 4,250,278, Cl. 525-340.000.
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Kawasaki, Kaoru; and Umehara, Masakazu, 4,249,364, Cl. 53-550.000.
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Underwood, Gary L.; and Wendorff, William L., to Red Arrow Products Company. Smoke flavored hydrophilic liquid concentrate and process of producing same. 4,250,199, Cl. 426-533.000.
Uni-Cardan Aktiengesellschaft: *See—*
Krude, Werner; and Harz, Peter, 4,249,395, Cl. 64-21.000.
Union Carbide Corporation: *See—*
Bartley, William J., 4,250,116, Cl. 564-467.000.
Langan, Richard A., 4,250,234, Cl. 429-206.000.
Robeson, Lloyd M.; Matzner, Markus; and Maresca, Louis M., 4,250,279, Cl. 525-425.000.
Tarancon, Gregorio, 4,249,917, Cl. 55-48.000.
Young, Frank G.; and Thorsteinson, Erlind M., 4,250,346, Cl. 585-658.000.
Union Oil Company of California: *See—*
Dhondt, Roland O., 4,249,855, Cl. 414-786.000.
United Glass Limited: *See—*
Ashcroft, Richard I.; Kaktovics, David; Monson, Anthony E. P.; and Weeks, David M., 4,250,405, Cl. 235-456.000.
United Kingdom Atomic Energy Authority: *See—*
Mattock, Patrick, 4,250,008, Cl. 204-180.00R.
Syred, Nicholas; and Roberts, Peter J., 4,249,575, Cl. 137-812.000.
United States of America

Agriculture: *See*—
Patereau, Myles A.; and Murray, Michael F., 4,249,655, Cl. 209-31.000.
Air Force: *See*—
Pearson, Jerome, 4,249,411, Cl. 73-12.000.
Task, Harry L., 4,249,823, Cl. 356-128.000.
Army: *See*—
Brody, Philip S., 4,250,567, Cl. 365-109.000.
Esaki, Leo; Tsu, Raphael; Sai-Halasz, George A.; and Chang, Leroy L., 4,250,515, Cl. 357-16.000.
Helm, David P.; and Flogaus, William S., 4,249,791, Cl. 350-16.000.
Ng, Gim S., 4,249,332, Cl. 42-1.00S.
Oliver, David W.; and Trzaskos, Casmir R., 4,250,428, Cl. 313-268.000.
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Bieberbach, George; Bongaards, Donald J.; Lohmeier, Alfred; and Duke, James M., 4,249,593, Cl. 165-70.000.
Yang, Ralph T.; Smol, Robert; Farber, Gerald; and Naphtali, Leonard M., 4,250,015, Cl. 208-10.000.
Interior: *See*—
Morrell, Roger J.; Larson, William C.; and Schmidt, Robert D., 4,249,777, Cl. 299-4.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Feldstein, Cyril; Lewis, Gilbert W.; Culler, Virgil H.; and Merrbaum, Samuel. Multifunctional transducer. 4,249,417, Cl. 73-141.00A.
Koliwad, Krishna M.; and Daud, Taher. Copper doped polycrystalline silicon solar cell. 4,249,957, Cl. 136-258.000.
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Bryan, Coleman J.; Wright, Edward E., Jr.; and Moyers, Clyde V., 4,250,143, Cl. 422-109.000.
Navy: *See*—
Gaunaurd, Guillermo C.; Uberall, Herbert M.; and Scharnhorst, Kurt P., 4,249,421, Cl. 73-589.000.
Gaunaurd, Guillermo C.; and Uberall, Herbert M., 4,249,422, Cl. 73-589.000.
Hansen, James D., Jr., 4,250,379, Cl. 250-229.000.
Hug, Charles R., 4,249,670, Cl. 220-295.000.
Jernigan, James L.; and Hughes, Richard S., 4,250,466, Cl. 331-94.50M.
U.S. Philips Corporation: *See*—
Lersmacher, Bernhard; Lydtin, Hans; Seifert, Horst; and Krol, Johannes W. A., 4,250,429, Cl. 313-346.00R.
Raabe, Gerhard, 4,250,514, Cl. 357-14.000.
Spruijt, Aloysius M. J. M., 4,249,800, Cl. 350-320.000.
United Technologies Corporation: *See*—
Benyi, Alexander, Jr.; and Kozlin, Joseph R., 4,249,859, Cl. 415-79.000.
Johnson, Gerard F.; and Schilke, Peter W., 4,249,913, Cl. 51-295.000.
Kear, Bernard H.; and King, William H., 4,250,229, Cl. 428-606.000.
Unitika Ltd.: *See*—
Uejima, Hiroyuki; Hirai, Masahide; and Kazigase, Masahiro, 4,250,031, Cl. 210-688.000.
University of California, The Regents of the: *See*—
Hapgood, William W.; and Krimetz, Wasyl, 4,249,785, Cl. 312-196.000.
University of Delaware: *See*—
August, Paul R.; and Reed, George A., 4,250,301, Cl. 536-4.000.
University of Utah: *See*—
Giddings, John C.; and Myers, Marcus N., 4,250,026, Cl. 209-155.000.
UOP Inc.: *See*—
Antos, George J., 4,250,020, Cl. 208-139.000.
Bailey, Charles H., 4,250,146, Cl. 422-179.000.
Flagg, John F.; and Antos, George J., 4,250,055, Cl. 252-441.000.
Frame, Robert R., 4,250,022, Cl. 208-206.000.
Imai, Tamotsu, 4,250,115, Cl. 564-436.000.
Michalko, Edward, 4,250,058, Cl. 252-448.000.
Peters, Kenneth D., 4,250,018, Cl. 208-49.000.
Peters, Kenneth D., 4,250,019, Cl. 208-49.000.
Rohrbach, Ronald P.; and Lester, George W., 4,250,080, Cl. 260-42.460.
Rohrbach, Ronald P.; and Levy, Joseph, 4,250,260, Cl. 435-176.000.
Sobel, Jay E.; and Brand, Vincent T., 4,250,131, Cl. 264-56.000.
Tu, Hosheng, 4,250,059, Cl. 252-455.00Z.
Urban, Peter, 4,250,153, Cl. 423-242.000.
Vesel, Lawrence M., 4,249,920, Cl. 55-233.000.
Winans, Vida, 4,250,263, Cl. 435-234.000.
Upjohn Company, The: *See*—
Hester, Jackson B., Jr., 4,250,094, Cl. 260-245.500.
McCall, John M., 4,250,181, Cl. 424-250.000.
Urban, John A., to Eaton Corporation. Slack adjuster. 4,249,644, Cl. 188-196.00D.
Urban, Peter, to UOP Inc. Flue gas treatment. 4,250,153, Cl. 423-242.000.
Usardi, Maria M.: *See*—
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Alessandro; Fumagalli, Angelo; Faustini, Franco; Ceserani, Roberto; and Usardi, Maria M., 4,250,188, Cl. 424-285.000.
USM Corporation: *See*—
Giebel, Gerhard, 4,249,279, Cl. 12-54.300.
Hollick, John G., 4,249,320, Cl. 36-68.000.
Sillars, Frederick S., 4,249,692, Cl. 228-15.100.
Vacu•Blast Corporation: *See*—
Soares, Paul; and Stanley, Henry J., 4,250,024, Cl. 209-10.000.
Valansot, Jean. Pressure-responsive electric switch. 4,250,434, Cl. 315-362.000.
Valence, Georges: *See*—
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Valmont Industries, Inc.: *See*—
Smith, Neil C.; and Scrutchfield, Donald H., 4,249,698, Cl. 239-1.000.
Van Allen, Kent: *See*—
Smith, Richard L.; and Van Allen, Kent, 4,250,543, Cl. 364-105.000.
Vance, Joseph E. Method and apparatus for suspending and transporting particulate material. 4,249,839, Cl. 406-109.000.
van de Mond, Theodorus J.; and Delahaye, Hubertus J. A., to Stamicarbon, B.V. Process for the preparation of cyclohexanone. 4,250,118, Cl. 568-338.000.
Vandenberk, Jan; Kennis, Ludo E. J.; Van der Aa, Marcel J. M. C.; and Van Heertum, Albert H. M. T., to Janssen Pharmaceutica N.V. Piperazine derivatives. 4,250,176, Cl. 424-250.000.
Van der Aa, Marcel J. M. C.: *See*—
Vandenberk, Jan; Kennis, Ludo E. J.; Van der Aa, Marcel J. M. C.; and Van Heertum, Albert H. M. T., 4,250,176, Cl. 424-250.000.
Van der Laken, Uitgeverij: *See*—
Buijtendorp, Thomas M., 4,249,741, Cl. 273-261.000.
van der Lely, Cornelis. Implement. 4,249,614, Cl. 172-261.000.
Van Doorn, Donald W.; Williams, Roy T.; and Hawkins, James B., to Lummus Industries, Inc. Apparatus for loading, transporting and unloading modules of seed cotton and the like. 4,249,850, Cl. 414-491.000.
Van Eenam, Donald N., to Monsanto Company. Wet strength paper additives. 4,250,212, Cl. 427-386.000.
Van Heertum, Albert H. M. T.: *See*—
Vandenberk, Jan; Kennis, Ludo E. J.; Van der Aa, Marcel J. M. C.; and Van Heertum, Albert H. M. T., 4,250,176, Cl. 424-250.000.
Vapor Corporation: *See*—
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Vatne, Rolf S.; and Woodmansee, Wayne E., to Boeing Company, The. Radiographic apparatus and method for monitoring film exposure time. 4,250,103, Cl. 250-402.000.
Vatsky, Joel, to Foster Wheeler Energy Corporation. Furnace structure. 4,249,470, Cl. 110-232.000.
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Veba Chemie Aktiengesellschaft: *See*—
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Vecera, Milos; and Skala, Josef, to Vyzkumny ustav bavlnarsky. Method of and apparatus for removing dirt particles from staple fibers and for straightening said fibers in an open-end spinning process. 4,249,370, Cl. 57-301.000.
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Korenev, Vladimir P.; Ippolitov, Jury S.; Belyaev, Boris P.; Kalninsh, Arvid Y.; Vedernikov, Nikolai A.; Krastinsh, Valter P.; Abolinsh, Guntis K.; Abele, Karl M.; and Ekis, Felix A., 4,249,703, Cl. 241-247.000.
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Fleischer, Donald W., 4,250,550, Cl. 364-465.000.
Vega Industries, Inc.: *See*—
Anderson, Billy B., 4,249,510, Cl. 126-121.000.
Vega, Roger E. Urological catheter. 4,249,536, Cl. 128-349.00B.
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Kaluzhsky, Nikolai A.; Gefter, Semen E.; Tsybukov, Igor K.; Evdokimov, Svetozar V.; Derkach, Alexei S.; Tsyplakov, Anatoly M.; Lankin, Valery P.; Velichko, Boris P.; Kostin, Albert A.; Volfson, Grigory E.; and Nikiforov, Vladimir P., 4,250,012, Cl. 204-243.00M.
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Vercellotti, Leonard C.: *See*—
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Vergara, Hector F.; and Alfonsin, Manuel. Magnetic card game apparatus. 4,249,742, Cl. 273-294.000.
VerMehren, Hubert R., to Ga-Vehren Engineering Company. Gumming apparatus. 4,249,984, Cl. 156-552.000.
Vermont Castings, Inc.: *See*—
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Vernaleken, Hugo: *See*—
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Vescelius, Lee E.: *See—*
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Vesel, Lawrence M., to UOP Inc. Scrubber and method utilizing wetted slotted screens for removing flyash from flue gas. 4,249,920, Cl. 55-233.000.
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Vickers, Richard S., to Eastman Kodak Company. P-Terphenyl organic photoconductors and heterogeneous compositions thereof. 4,250,237, Cl. 430-17.000.
Viertl, John R. M.; and Jones, Marshall G., to General Electric Company. Semi-nondestructive residual stress measurement. 4,249,423, Cl. 73-783.000.
Vilkomerson, David H. R.; Mezrich, Reuben S.; and Rubin, Carl S., to Technicare Corporation. Ultrasound needle tip localization system. 4,249,539, Cl. 128-660.000.
Villeneuve, Norman R.; and Smith, William J. Workpiece turning hand tool with torque control. 4,249,435, Cl. 81-477.000.
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Sprecker, Mark A.; Sanders, James M.; Schreiber, William L.; Watkins, Hugh; Vinals, Joaquin F.; Shuster, Edward J.; O'-Rourke, Thomas J.; Hagedorn, Myrna L.; and Klemarczyk, Philip, 4,250,338, Cl. 568-343.000.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,250,342, Cl. 568-826.000.
Trenkle, Robert W.; Mookherjee, Braja D.; Hall, John B.; Kasper, Robin; Vock, Manfred H.; Schreck, Ronald; Granda, Edward J.; and Vinals, Joaquin F., 4,250,332, Cl. 568-347.000.
Wilson, Richard A.; Schreiber, William L.; Mookherjee, Braja D.; Kiwala, Jacob; Vinals, Joaquin F.; Vock, Manfred H.; Stork, Gilbert; and Schmitt, Frederick L., 4,250,049, Cl. 252-174.110.
Vitek, John M.: *See—*
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Vivitar Corporation: *See—*
Moskovich, Jacob, 4,249,798, Cl. 350-423.000.
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Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,250,194, Cl. 426-3.000.
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Vinals, Joaquin F.; Kiwala, Jacob; and Schmitt, Frederick L., 4,250,201, Cl. 426-538.000.
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Trenkle, Robert W.; Mookherjee, Braja D.; Hall, John B.; Kasper, Robin; Vock, Manfred H.; Schreck, Ronald; Granda, Edward J.; and Vinals, Joaquin F., 4,250,332, Cl. 568-347.000.
Wiegers, Wilhelmus J.; Sprecker, Mark A.; Watkins, Hugh; Vock, Manfred H.; and Schmitt, Frederick L., 4,250,200, Cl. 426-536.000.
Wilson, Richard A.; Schreiber, William L.; Mookherjee, Braja D.; Kiwala, Jacob; Vinals, Joaquin F.; Vock, Manfred H.; Stork, Gilbert; and Schmitt, Frederick L., 4,250,049, Cl. 252-174.110.
Voigt, Jurgen: *See—*
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Volkswagenwerk Aktiengesellschaft: *See—*
Grundmann, Edgard; Herbst, Udo; and Pommerenke, Horst, 4,249,375, Cl. 60-309.000.
Lucchini, Erich; and Kramer, Martin, 4,249,632, Cl. 180-274.000.
Schwanz, Wilfried; and Seiffert, Ulrich, 4,249,756, Cl. 280-804.000.
Voll, Walter; and Matheis, Anton, to Ford Motor Company. Chassis and suspension arrangement for motor vehicles. 4,249,627, Cl. 180-73.00D.
Volz, Hans G.: *See—*
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Vomel, Wolfgang: *See—*
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von Bonin, Wulf; and Vehlewald, Peter, to Bayer Aktiengesellschaft. Stable suspensions of inorganic fillers in organic polyhydroxyl compounds for polyurethane preparation. 4,250,077, Cl. 260-37.00N.
Voss, Clifford C. Magnetic fabric fastener and closure means. 4,249,267, Cl. 2-69.000.
Voytko, James E., to Western Electric Company, Inc. Methods of and apparatus for advancing elongated material. 4,249,689, Cl. 226-172.000.
Vukovic, Marko. Power generating apparatus. 4,249,639, Cl. 185-30.000.
Vurpillat, Victor V.: *See—*
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Hill, Richard N., 4,250,154, Cl. 423-317.000.
Karabinos, Joseph V.; and Nickell, Louis G., 4,250,319, Cl. 549-61.000.
Schirmer, Henry G., 4,249,659, Cl. 206-471.000.
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WABCO Westinghouse GmbH: *See—*
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Waddington, Alan; and Martin, Alfred C., to Westland Aircraft Limited. Damper means for helicopter rotors. 4,249,862, Cl. 416-134.00A.
Wade, Gerald J., to Honeywell Inc. Automated micro-organism culture growth and detection instrument. 4,250,266, Cl. 435-289.000.
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Wakabayashi, Osamu; Matsuya, Kuni; Ohta, Hiroki; Jikihara, Tetsuo; and Suzuki, Seiichi, to Mitsubishi Chemical Industries, Limited. 1,2-Alkylene-4-substituted urazole herbicides. 4,249,934, Cl. 71-92.000.
Wakasugi, Osamu: *See—*
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Walda, Kim L. Cardioplegic fluid refrigeration and delivery system. 4,249,923, Cl. 62-394.000.
Waletzko, Alfred. Isolating and backflow preventing valve assembly. 4,249,556, Cl. 137-107.000.
Walser, Armin, to Hoffmann-La Roche Inc. Imidazobenzodiazepines. 4,250,095, Cl. 260-245.600.
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Walter, Arthur, to Erwin Sick GmbH, Optik-Elektronik. Light barrier receiver. 4,250,498, Cl. 340-556.000.
Waiter, Jurgen, to Hackforth GmbH & Co. KG. Flexible shaft coupling. 4,249,394, Cl. 64-11.00R.
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Babson, Arthur L.; and Turner, James E., 4,250,041, Cl. 252-1.000.
Schwender, Charles F.; and Sunday, Brooks R., 4,250,177, Cl. 424-250.000.
Warnier, Jean. Weapon casing. 4,249,687, Cl. 224-913.000.
Warren, John B.; and Kundrath, Michael R., to Connecticut Research Institute, Inc. Production of electron microscope grids and other micro-components. 4,250,127, Cl. 264-22.000.
Watanabe, Junichi; Koide, Hiroshi; and Temmyo, Shigemoto, to Ricoh Company, Ltd. Moving-coil type motor. 4,250,416, Cl. 310-13.000.
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Waters, John V. Nailing tool and method of nailing. 4,249,297, Cl. 29-432.000.
Watkins, David M.: *See—*
Hydes, Paul D.; and Watkins, David M., 4,250,189, Cl. 424-287.000.
Watkins, Hugh: *See—*
Sprecker, Mark A.; Sanders, James M.; Schreiber, William L.; Watkins, Hugh; Vinals, Joaquin F.; Shuster, Edward J.; O'-Rourke, Thomas J.; Hagedorn, Myrna L.; and Klemarczyk, Philip, 4,250,338, Cl. 568-343.000.
Wiegers, Wilhelmus J.; Sprecker, Mark A.; Watkins, Hugh; Vock, Manfred H.; and Schmitt, Frederick L., 4,250,200, Cl. 426-536.000.
Watson, Richard D., to General Motors Corporation. Automatic belt tensioning mechanism. 4,249,425, Cl. 474-110.000.
Weaver, Robert F.: *See—*
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Meyer, Hans R.; and Weber, Kurt, 4,250,317, Cl. 548-327.000.
Webster, Ronald B.; and Larsen, Ronald P., to Gerber Scientific Instrument Company, The. Color plotting device and method. 4,249,807, Cl. 354-4.000.

Webster, Ronald B., to Gerber Scientific Instrument Company, The. Photoplotting in color with exposure budgeting. 4,249,808, Cl. 354-4.000.
Weckerly, Darl E. Pump jacks. 4,249,376, Cl. 60-369.000.
Weckler, Gerhard; Hauss, Hans J.; Hintermeier, Karl; and Engelhardt, Friedrich, to Cassella Aktiengesellschaft. Levelling agent and process for the even dyeing of materials made of synthetic fibers. 4,250,296, Cl. 528-295.000.
Weeks, David M.: *See*—
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Wehr Corporation: *See*—
McNabney, John C., 4,249,571, Cl. 137-601.000.
Wehrli, Hans. Brake for a ski with a safety-binding. 4,249,752, Cl. 280-605.000.
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Weinmann, Karl; Kuo, Ted L. C.; and Greenwood, William S., to Thomas & Betts Corporation. Method for electrical connection of flat cables. 4,249,303, Cl. 29-868.000.
Weinmann, Karl; and Kuo, Ted L. C., to Thomas & Betts Corporation. Method of connecting flat electrical cables. 4,249,304, Cl. 29-872.000.
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Weiss, Paul D., to Transamerica DeLaval Inc. Check-valve construction. 4,249,567, Cl. 137-512.000.
Weissman, Adrian, to Singer Company, The. Motor braking arrangement and method. 4,250,436, Cl. 318-245.000.
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Mantegani, Enzo, 4,249,895, Cl. 432-128.000.
Wells, Roger, to Weyerhaeuser Company. Steam shower for adjusting paper moisture profile. 4,249,992, Cl. 162-198.000.
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Welsh, Jay Y., to Chemetals Corporation. Manganese nitrate decomposition. 4,250,149, Cl. 423-50.000.
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Weresch, Thomas. Apparatus for cutting to length, bending and crimping the connecting wires of electrical components. 4,249,581, Cl. 140-105.000.
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Werner, Wolfgang: *See*—
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Werych, Ewald R., to General Signal Corporation. Industrial furnace with ceramic insulating modules having internal grid support. 4,249,888, Cl. 432-3.000.
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Krukemeier, Richard; Merten, Uwe; and Stahlmann, Willi, 4,249,651, Cl. 198-509.000.
West, Wilfred H. Fence climber. 4,249,635, Cl. 182-92.000.
Western Electric Company, Inc.: *See*—
Brown, Donald R.; Masopust, Otto T., Jr.; and Meal, John R., 4,250,534, Cl. 361-272.000.
Celler, George K., 4,249,962, Cl. 148-1.500.
Lavigna, Robert J.; and Reusser, Raymond E., 4,249,988, Cl. 156-605.000.
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Western Farm Services Inc.: *See*—
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Cookson, Alan H., 4,250,362, Cl. 200-144.0AP.
Daniels, Michael G., 4,250,448, Cl. 324-127.000.
Darwent, Richard H.; Phillips, George R.; and Karol, Herman S., 4,249,640, Cl. 187-1.00R.
DeCaro, Aristide R.; and Strobel, Rudolf F., 4,249,887, Cl. 431-365.000.
Dudash, Allan A.; Melvin, Waymon A., Jr.; and Vercellotti, Leonard C., 4,250,489, Cl. 340-147.00T.
Elms, Robert T., 4,250,552, Cl. 364-483.000.
Hundstad, Richard L.; and Farish, Owen, 4,250,468, Cl. 331-94.5PE.
Johnston, Robert J.; Layciak, Stephen G.; and Dobrosielski, Stephen S., 4,250,368, Cl. 200-307.000.
Jones, Andrew R., 4,249,514, Cl. 126-438.000.
Kraft, Joseph K., 4,249,649, Cl. 198-332.000.
Shum, Lanson Y., 4,250,449, Cl. 324-142.000.
Westland Aircraft Limited: *See*—
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Wexler, Howard. Doll with sound generator and plural switch means. 4,249,338, Cl. 46-232.000.
Weyand, Karl; and Stock, Gunter, to Trefilarbed S.A. Apparatus for the continuous treatment of metal objects. 4,249,720, Cl. 266-104.000.
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White, Claude C. Mine roof support plate. 4,249,835, Cl. 405-259.000.
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White, Loren H., to General Electric Company. Cross-ignition assembly for combustion apparatus. 4,249,372, Cl. 60-39.320.
White, Pat M. Hydraulic running tool for liner hangers. 4,249,601, Cl. 166-208.000.
Wiederrich, James L.; Chang, Andrew K.; and Muray, Julius J., to FMC Corporation. Apparatus for measuring wheel alignment of motor vehicles. 4,249,824, Cl. 356-155.000.
Wiegers, Wilhelmus J.; Sprecker, Mark A.; Watkins, Hugh; Vock, Manfred H.; and Schmitt, Frederick L., to International Flavors & Fragrances Inc. Flavoring with a mixture of isochroman musk compounds. 4,250,200, Cl. 426-536.000.
Wielinger, Hans; Rittersdorf, Walter; Bleisteiner, Manfred; Zimmermann, Gerd; Werner, Wolfgang; and Vomel, Wolfgang, to Boehringer Mannheim GmbH. Microbiological test device. 4,250,256, Cl. 435-32.000.
Wieser, Alfred, to Medtronic GmbH. Tooth treatment apparatus. 4,249,901, Cl. 433-119.000.
Wieshofer, Anton: *See*—
Heil, Richard; Gatschmann, Klaus; and Wieshofer, Anton, 4,249,546, Cl. 131-70.000.
Wilbert, Inc.: *See*—
Work, Gerald L., 4,249,289, Cl. 27-35.000.
Wilder, Thomas C., to Kennecott Copper Corporation. Apparatus and process for producing copper-boron carbide composite by electrolytic entrapment. 4,249,998, Cl. 204-16.000.
Wilhelm Abt GmbH & Co. KG: *See*—
Godeke, Henning, 4,249,764, Cl. 294-55.500.
Williams, Alan: *See*—
Banks, Reginald G. S.; and Williams, Alan, 4,250,060, Cl. 252-466.00J.
Williams, Charles: *See*—
Provencher, Roland; and Williams, Charles, 4,249,763, Cl. 294-19.00R.
Williams, D. Michael: *See*—
Chase, Richard A.; Williams, D. Michael; and Simpson, Danny E., 4,249,333, Cl. 46-1.00R.
Williams, Eugene E.: *See*—
Noyes, Ronald T.; and Williams, Eugene E., 4,249,891, Cl. 432-14.000.
Williams Gold Refining Company Incorporated: *See*—
Mohammed, M. Hamdi A.; Agarwal, Dwarika P.; and Ingersoll, Clyde E., 4,249,943, Cl. 75-171.000.
Williams, Roy T.: *See*—
Van Doorn, Donald W.; Williams, Roy T.; and Hawkins, James B., 4,249,850, Cl. 414-491.000.
Williams, Wilburn R. Plant support. 4,249,342, Cl. 47-43.000.
Willim, Fritz, to Concast AG. Method for continuous casting. 4,249,590, Cl. 164-82.000.
Willmott, Leo C.: *See*—
Grondahl, Clayton M.; Willmott, Leo C.; and Muth, Myron C., 4,249,291, Cl. 29-156.80H.
Wilson, Paul H., to Boeing Company, The. Method for reticulating an adhesive to conform to a surface of an apertured workpiece. 4,249,974, Cl. 156-85.000.
Wilson, Richard A.; Schreiber, William L.; Mookherjee, Braja D.; Kiwala, Jacob; Vinals, Joaquin F.; Vock, Manfred H.; Stork, Gilbert; and Schmitt, Frederick L., to International Flavors & Fragrances Inc. 2,6,6-Trimethyl-α-(iso)propenyl-1-cyclohexene-1-methanols and -1,3-cyclohexadiene-1-methanols and organoleptic uses thereof. 4,250,049, Cl. 252-174.110.
Wilusz, Henryk: *See*—
Bambuch, Tadeusz; Wilusz, Henryk; Englert, Wieslaw; Czank, Stanislaw; and Surmiak, Stanislaw, 4,249,964, Cl. 148-16.500.
Wilwerding, Dennis J., to Honeywell Inc. Low contrast bias auto focus system. 4,250,377, Cl. 250-204.000.
Wilwerding, Dennis J.: *See*—
Joseph, James D.; and Wilwerding, Dennis J., 4,250,376, Cl. 250-204.000.
Winans, Vida, to UOP Inc. Method of purification of thermally stable enzymes. 4,250,263, Cl. 435-234.000.
Windmoller & Holscher: *See*—
Tetenborg, Konrad; and Huwelmann, Helmut, 4,249,361, Cl. 53-415.000.
Wingard, Jefferson C. Directional circular loop beam antenna. 4,250,507, Cl. 343-742.000.
Winstead, Thomas W., to Maryland Cup Corporation. Method for the continuous formation of biaxially oriented thermoplastic materials

and forming articles therefrom in a continuous process. 4,250,129, Cl. 264-37.000.

Winter, Richard L.: *See*—
Connolly, John R.; Gibson, David E.; Heimark, Edward L.; Quinn, Jerome B.; Speechley, Richard E.; and Winter, Richard L., 4,249,863, Cl. 416-185.000.

Wire Cloth Products, Inc.: *See*—
Cozzi, John F.; and Maczko, Edward M., Jr., 4,250,039, Cl. 210-416.500.

Witter, Gerald J., to Fansteel Inc. Method of making electrical contact material. 4,249,944, Cl. 75-211.000.

Witzel, Bruce E.: *See*—
Grier, Nathaniel; Dybas, Richard A.; and Witzel, Bruce E., 4,250,184, Cl. 424-267.000.

Wohlrab, Walter, to Krauss-Maffei Aktiengesellschaft. Mold-closing device for an injection-molding machine. 4,249,880, Cl. 425-451.200.

Wolber: *See*—
Duttlinger, Jean C., 4,249,587, Cl. 152-354.00R.

Wolf, Alfons: *See*—
Dorries, Peter; Piesch, Steffen; and Wolf, Alfons, 4,250,282, Cl. 525-509.000.

Wolff, Michael: *See*—
Klauck, Bernd; and Wolff, Michael, 4,250,502, Cl. 340-728.000.

Wolfrum, Gerhard: *See*—
Hugl, Herbert; Wolfrum, Gerhard; Reel, Henning; Kunnel, Werner; Kuth, Robert; and Gohrbandt, Wilhelm, 4,249,275, Cl. 8-532.000.

Wolters, Tjako A., to Ballast-Nedam Groep N.V.; and Amsterdamse Ballast Bagger. Transport conduit. 4,250,034, Cl. 210-170.000.

Woodland, Sylvester L., to Aquasonics, Inc. Potato sorting apparatus. 4,249,660, Cl. 209-555.000.

Woodmansee, Wayne E.: *See*—
Vatne, Rolf S.; and Woodmansee, Wayne E., 4,250,103, Cl. 250-402.000.

Wooler, Alan M.; and Bengtson, Olle, to Imperial Chemical Industries Limited. Methods for consolidating radioactive waste material using self-setting or water-settable compositions containing an organic polyisocyanate, a non-ionic surface active agent devoid of isocyanate-reactive groups and alkaline filler. 4,249,949, Cl. 106-90.000.

Woolfolk, Charles E., to Save Fuel Corporation. Automatic damper device. 4,249,883, Cl. 431-20.000.

Work, Gerald L., to Wilbert, Inc. Combination burial vault and casket and funeral and burial method or system employing the same. 4,249,289, Cl. 27-35.000.

Workman, William S., Sr. Remote station monitoring system. 4,250,352, Cl. 179-2.00A.

Worlock, John M., to Bell Telephone Laboratories, Incorporated. Multistage avalanche photodetector. 4,250,516, Cl. 357-16.000.

Worsham, Daniel, to Pacific Western Systems, Inc. Rotary vacuum seal for a wafer transport system. 4,249,846, Cl. 414-217.000.

Wright, David I., to RCA Corporation. Video signal dropout compensator. 4,250,521, Cl. 358-8.000.

Wright, Edward E., Jr.: *See*—
Bryan, Coleman J.; Wright, Edward E., Jr.; and Moyers, Clyde V., 4,250,143, Cl. 422-109.000.

Wu, Chung P.: *See*—
Schnable, George L.; and Wu, Chung P., 4,249,960, Cl. 148-1.500.

Wu, Helen Y.; Smith, Thomas H.; and Henry, David W., to SRI International. N-Benzyl anthracyclines. 4,250,303, Cl. 536-17.00A.

Wuerzer, Bruno: *See*—
Hansen, Hanspeter; Eicken, Karl; and Wuerzer, Bruno, 4,249,933, Cl. 71-88.000.
Hansen, Hanspeter; Eicken, Karl; and Wuerzer, Bruno, 4,249,935, Cl. 71-92.000.

Wyar, Paul F.: *See*—
Richmond, Robert L.; and Wyar, Paul F., 4,250,458, Cl. 329-112.000.

Wynn, Gayle B. Reinforced insulated wall construction. 4,249,354, Cl. 52-438.000.

Wyoming Mineral Corporation: *See*—
Shuck, David L.; and Chien, Calvin C., 4,249,776, Cl. 299-4.000.

Xerox Corporation: *See*—
Durbin, John A.; and Rees, James D., 4,250,538, Cl. 362-97.000.

Yamada, Akira: *See*—
Saegusa, Takeo; Yamada, Akira; Iwase, Masaaki; and Iwatani, Akitoshi, 4,250,300, Cl. 528-401.000.

Yamada, Koukiti; and Miyake, Katsuyuki, to Nippondenso Co., Ltd. Detection of engine speed in response to ignition operation. 4,250,450, Cl. 324-169.000.

Yamada, Takashi: *See*—
Ebihara, Heihachiro; Sekiya, Fukuo; and Yamada, Takashi, 4,250,571, Cl. 368-10.000.

Yamaki, Kiyoshi: *See*—
Mizote, Masanori; Yamaki, Kiyoshi; Oka, Takashi; Matsuoka, Hideoki; Nomura, Hiroyuki; and Mogi, Takaaki, 4,250,402, Cl. 235-92.0DN.
Nomura, Hiroyuki; Mogi, Takaaki; Mizote, Masanori; Yamaki, Kiyoshi; Oka, Takashi; and Matsuoka, Hideoki, 4,250,403, Cl. 235-92.0DN.

Yamakido, Kazuo; and Tsukamoto, Nobuo, to Hitachi, Ltd. Non-uniform weighting circuitry. 4,250,492, Cl. 340-347.0DA.

Yamamichi, Masayoshi: *See*—
Suzuki, Masayuki; Ito, Tadashi; Yamamichi, Masayoshi; and Murakami, Hiroyasu, 4,249,816, Cl. 354-266.000.

Yamamoto, Kenji: *See*—
Kimura, Morihiro; Yamamoto, Kenji; and Nose, Masahiko, 4,249,680, Cl. 222-598.000.

Yamamoto, Tomio: *See*—
Yasue, Setsuo; and Yamamoto, Tomio, 4,249,682, Cl. 224-42.230.

Yamamoto, Yukio; and Tezuka, Takeo, to Tamura Electric Works, Ltd. Electromagnetic counters. 4,250,404, Cl. 235-92.0FP.

Yamane, Hiroyuki: *See*—
Nishikido, Joji; Tamura, Nobuhiro; Fukuoka, Yohei; and Yamane, Hiroyuki, 4,250,110, Cl. 564-156.000.

Yamaryo, Yasuyuki: *See*—
Yoshiike, Katsushi; Igarashi, Toru; and Yamaryo, Yasuyuki, 4,250,381, Cl. 250-237.00G.

Yamashita, Seiji: *See*—
Sento, Hiroshi; Tanabe, Shoji; Shimozu, Tadao; Yamashita, Seiji; and Miyashita, Kunio, 4,250,424, Cl. 310-261.000.

Yang, Charles S., to Yang Electromagnetic Systems Inc. Fixed and movable supporting of dual magnetic heads. 4,250,530, Cl. 360-105.000.

Yang Electromagnetic Systems Inc.: *See*—
Yang, Charles S., 4,250,530, Cl. 360-105.000.

Yang, Lau S., to American Can Company. Demethylated lignin and process. 4,250,088, Cl. 260-124.00R.

Yang, Ralph T.; Smol, Robert; Farber, Gerald; and Naphtali, Leonard M., to United States of America, Energy. Mechanochemical hydrogenation of coal. 4,250,015, Cl. 208-10.000.

Yap, Crescencio T.; and Castelbaum, Leonard, to Amerace Corporation. Process for making elastomeric hose. 4,249,971, Cl. 156-143.000.

Yartsev, Igor K.: *See*—
Kolosov, Ivan A.; Kuryshev, Nikolai V.; Ivanyatov, Jury E.; Kalininskaya, Vera N.; Yartsev, Igor K.; Pugachev, Arkady K.; and Savina, Svetlana M., 4,250,204, Cl. 427-58.000.

Yasue, Setsuo; and Yamamoto, Tomio, to Sankokiki Kabushiki Kaisha. Spare wheel protecting system. 4,249,682, Cl. 224-42.230.

Yasuno, Hiroshi; Yoshinaga, Toshimune; and Nakano, Tsunetomo, to Ube Industries, Ltd. Photocurable acrylic phosphate esters of epoxidized polybutadiene. 4,250,007, Cl. 204-159.230.

Yates, Dow. Chlorine generator and method. 4,250,126, Cl. 261-70.000.

Yates, Frank S.: *See*—
McMahon, Philip J.; and Yates, Frank S., 4,250,340, Cl. 568-639.000.

Yates, Raymond W., to British Industrial Plastics, Limited. Modified melamine-formaldehyde condensation products. 4,250,069, Cl. 260-29.40R.

Yeda Research and Development Co. Ltd.: *See*—
Dostrovsky, Israel, 4,249,513, Cl. 126-438.000.
Trainin, Nathan, 4,250,084, Cl. 260-112.00R.

Yoder Brake & Manufacturing Co., Inc.: *See*—
Yoder, Herbert G., 4,249,643, Cl. 188-112.00R.

Yoder, Herbert G., to Yoder Brake & Manufacturing Co., Inc. Method and apparatus for actuating trailer brakes. 4,249,643, Cl. 188-112.00R.

Yolinsky, Robert H.: *See*—
Cerwin, Robert J.; and Yolinsky, Robert H., 4,249,656, Cl. 206-63.300.

Yoo, Jin S.: *See*—
Masologites, George P.; Sun, Jui-Yuan; Yoo, Jin S.; and Burk, Emmett H., Jr., 4,249,910, Cl. 44-1.0SR.

Yoshida, Katsuyoshi: *See*—
Takahashi, Hisashi; Hanai, Satoshi; and Yoshida, Katsuyoshi, 4,250,207, Cl. 427-211.000.

Yoshida, Masaru, to Citizen Watch Company Limited. Watch module construction. 4,250,572, Cl. 368-71.000.

Yoshida, Ryo: *See*—
Takemoto, Ichiki; Sumida, Seizo; Yoshida, Ryo; and Kamoshita, Katsuzo, 4,249,938, Cl. 71-98.000.

Yoshida, Takashi; and Sakaguchi, Shinji, to Fuji Photo Film Co., Ltd. Photographic element for color diffusion transfer process. 4,250,243, Cl. 430-215.000.

Yoshida, Toshio: *See*—
Takahashi, Katsuhiro; Muraki, Shigeru; and Yoshida, Toshio, 4,250,117, Cl. 568-377.000.

Yoshida, Yoshinobu: *See*—
Itoh, Isamu; and Yoshida, Yoshinobu, 4,250,246, Cl. 430-223.000.

Yoshida, Yoshiyasu. Heat insulating insert for footwear. 4,249,319, Cl. 36-2.600.

Yoshiike, Katsushi; Igarashi, Toru; and Yamaryo, Yasuyuki, to Mitutoyo Mfg., Co., Ltd. Linear scale type measuring device. 4,250,381, Cl. 250-237.00G.

Yoshimura, Kazunori: *See*—
Ito, Katsuo; Murata, Bunjiro; and Yoshimura, Kazunori, 4,249,790, Cl. 339-177.00E.

Yoshinaga, Toshimune: *See*—
Yasuno, Hiroshi; Yoshinaga, Toshimune; and Nakano, Tsunetomo, 4,250,007, Cl. 204-159.230.

Young, David M.: *See*—
Dean, Desmond A.; and Young, David M., 4,249,526, Cl. 128-203.150.

Young, Frank G.; and Thorsteinson, Erlind M., to Union Carbide Corporation. Low temperature oxydehydrogenation of ethane to ethylene. 4,250,346, Cl. 585-658.000.

Young, William R., to General Electric Company. Method for improving a property of an alloy. 4,249,963, Cl. 148-16.000.

Yribarren, Philippe: *See*—
Studievic, Claude; Brossard, Guy; and Yribarren, Philippe, 4,249,826, Cl. 356-244.000.

Zafar, Humayon Z.: *See*—
Ruskin, Richard P.; Zafar, Humayon Z.; Goens, Duane N.; Hyatt, David E.; and Kenney, Charlie W., 4,250,157, Cl. 423-417.000.
Zakiewicz, Bohdan M., to British Sulphur Corp., Ltd. Mining of sulphur. 4,249,775, Cl. 299-4.000.
Zaouk, Aref: *See*—
Constant, Georges; Haran, Raymond; Lebugle, Albert; Zaouk, Aref; Morancho, Roland; and Pouvreau, Philippe, 4,250,205, Cl. 427-87.000.
Zaramella, Bruno: *See*—
Cardone, Michele; Grandini, Angelo; and Zaramella, Bruno, 4,250,478, Cl. 335-288.000.
Zeeh, Bernd: *See*—
Buschmann, Ernst; Goetz, Norbert; Zeeh, Bernd; and Varwig, Juergen, 4,250,123, Cl. 260-185.000.
Zeidler, Georg: *See*—
Eilingsfeld, Heinz; Hansen, Guenter; Seybold, Guenther; and Zeidler, Georg, 4,250,090, Cl. 260-158.000.
Zener, Clarence: *See*—
Molini, Alberto E.; and Zener, Clarence, 4,249,383, Cl. 60-641.000.
Zenith Radio Corporation: *See*—
Hofmann, Judson A., 4,250,457, Cl. 329-101.000.
Jacobs, Joseph M., 4,249,582, Cl. 140-105.000.
Ziebold, S. A.: *See*—
Argo, Wesley B.; Kocatas, Babur M.; and Ziebold, S. A., 4,249,918, Cl. 55-97.000.
Ziegler, Gunther, to SGF - Suddeutsche Gelenkscheibenfabrik GmbH & Co. KG. Flexible coupling. 4,249,396, Cl. 64-27.0NM.
Zijlstra, Kornelis N., to Shell Oil Company. Marine conductor string provided with a connector and a connector for use in such a marine conductor string. 4,249,611, Cl. 166-367.000.
Zimmermann, Gerd: *See*—
Wielinger, Hans; Rittersdorf, Walter; Bleisteiner, Manfred; Zimmermann, Gerd; Werner, Wolfgang; and Vomel, Wolfgang, 4,250,256, Cl. 435-32.000.
Zolman, Charles T., to General Electric Company. Holder for overload protector. 4,250,419, Cl. 310-68.00C.
zur Hausen, Manfred; Kaufhold, Manfred; and Lange, Erhard, to Chemische Werke Huls Aktiengesellschaft. Two stage hydrogenation to make neopentyl glycol. 4,250,337, Cl. 568-853.000.
Zweifel, Hans: *See*—
Kvita, Vratislav; Zweifel, Hans; and Greber, Gerd, 4,250,096, Cl. 260-326.00N.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 10TH DAY OF FEBRUARY, 1981

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

American Cyanamid Company: *See—*
Paul, Rolf; and Menschik, Judith, Re. 30,511, Cl. 424-249.000.

Bleukens, Adrianus A. J., deceased; by De Haan, Friedrich J., administrator; Stoffels, Jacobus; and Peters, Petrus J. M., to U.S. Philips Corporation. Color splitting prism assembly. Re. 30,513, Cl. 358-55.000.

De Haan, Friedrich J., administrator: *See—*
Bleukens, Adrianus A. J., deceased; De Haan, Friedrich J., administrator; Stoffels, Jacobus; and Peters, Petrus J. M., Re. 30,513, Cl. 358-55.000.

Eaton Corporation: *See—*
Hyink, Roy; Jaskolski, Stanley V.; Lade, Robert W.; Schutten, Herman P.; and Spellman, Gordon B., Re. 30,514, Cl. 361-103.000.

Hyink, Roy; Jaskolski, Stanley V.; Lade, Robert W.; Schutten, Herman P.; and Spellman, Gordon B., to Eaton Corporation. Thermally self-protected power switching semiconductor device. Re. 30,514, Cl. 361-103.000.

Jaskolski, Stanley V.: *See—*
Hyink, Roy; Jaskolski, Stanley V.; Lade, Robert W.; Schutten, Herman P.; and Spellman, Gordon B., Re. 30,514, Cl. 361-103.000.

Kaster, Robert L. Heart valve prosthesis. Re. 30,507, Cl. 3-1.500.

Kurokawa, Hideo: *See—*
Taniyasu, Ryozo; Kurokawa, Hideo; and Saito, Takeshi, Re. 30,510, Cl. 252-431.00C.

Lade, Robert W.: *See—*
Hyink, Roy; Jaskolski, Stanley V.; Lade, Robert W.; Schutten, Herman P.; and Spellman, Gordon B., Re. 30,514, Cl. 361-103.000.

Lion Fat and Oil Company Limited, The: *See—*
Taniyasu, Ryozo; Kurokawa, Hideo; and Saito, Takeshi, Re. 30,510, Cl. 252-431.00C.

Menschik, Judith: *See—*
Paul, Rolf; and Menschik, Judith, Re. 30,511, Cl. 424-249.000.

Paul, Rolf; and Menschik, Judith, to American Cyanamid Company. Imidazo[1,5-d]-as-triazine-4(3H)-ones and thiones. Re. 30,511, Cl. 424-249.000.

Peters, Petrus J. M.: *See—*
Bleukens, Adrianus A. J., deceased; De Haan, Friedrich J., administrator; Stoffels, Jacobus; and Peters, Petrus J. M., Re. 30,513, Cl. 358-55.000.

Peterson, Robert A. Refuse compactor. Re. 30,509, Cl. 100-227.000.

Raudat, John L.; and Rydell, Adam Z., to Standard-Knapp, Inc. Apparatus for straightening cell-forming partitions in a carton. Re. 30,508, Cl. 493-409.000.

Rydell, Adam Z.: *See—*
Raudat, John L.; and Rydell, Adam Z., Re. 30,508, Cl. 493-409.000.

Saito, Takeshi: *See—*
Taniyasu, Ryozo; Kurokawa, Hideo; and Saito, Takeshi, Re. 30,510, Cl. 252-431.00C.

Schutten, Herman P.: *See—*
Hyink, Roy; Jaskolski, Stanley V.; Lade, Robert W.; Schutten, Herman P.; and Spellman, Gordon B., Re. 30,514, Cl. 361-103.000.

Spellman, Gordon B.: *See—*
Hyink, Roy; Jaskolski, Stanley V.; Lade, Robert W.; Schutten, Herman P.; and Spellman, Gordon B., Re. 30,514, Cl. 361-103.000.

Standard-Knapp, Inc.: *See—*
Raudat, John L.; and Rydell, Adam Z., Re. 30,508, Cl. 493-409.000.

Stires, John C., III. Strip chart recorder. Re. 30,512, Cl. 346-19.000.

Stoffels, Jacobus: *See—*
Bleukens, Adrianus A. J., deceased; De Haan, Friedrich J., administrator; Stoffels, Jacobus; and Peters, Petrus J. M., Re. 30,513, Cl. 358-55.000.

Taniyasu, Ryozo; Kurokawa, Hideo; and Saito, Takeshi, to Lion Fat and Oil Company Limited, The. Process for preparing catalyst for olefin polymerization. Re. 30,510, Cl. 252-431.00C.

U.S. Philips Corporation: *See—*
Bleukens, Adrianus A. J., deceased; De Haan, Friedrich J., administrator; Stoffels, Jacobus; and Peters, Petrus J. M., Re. 30,513, Cl. 358-55.000.

LIST OF DESIGN PATENTEES

Adam, John M. Urinal screen. 258,181, 2-10-81, Cl. D6-86.000.

Adamson, Gerald J., to Coleman Company, Inc., The. Jug. 258,196, 2-10-81, Cl. D9-376.000.

Airhart, Tom P., to Skyline Industries, Inc. Fishing rod handle. 258,231, 2-10-81, Cl. D22-23.000.

Anderson, Lowell M.; Arendt, William F.; Graser, Clarence F.; Viegas, Herman H.; and Volk, Rodney H., to Thermo King Corporation. Cover for transport refrigeration unit. 258,234, 2-10-81, Cl. D23-142.000.

Anspach Effort, Inc., The: *See—*
Anspach, William, 258,237, Cl. D24-28.000.

Anspach, William, to Anspach Effort, Inc., The. Surgical instrument. 258,237, 2-10-81, Cl. D24-28.000.

Arcair Company: *See—*
Hoffman, Stephen A., 258,193, Cl. D8-30.000.

Arendt, William F.: *See—*
Anderson, Lowell M.; Arendt, William F.; Graser, Clarence F.; Viegas, Herman H.; and Volk, Rodney H., 258,234, Cl. D23-142.000.

Arigato Fashions, Incorporated: *See—*
Takada, Yuzo; and Rim, Sang Y., 258,240, Cl. D28-7.000.
Takada, Yuzo; and Rim, Sang Y., 258,241, Cl. D28-7.000.

Astor, Barbara; and Scalice, John J., to Revlon, Inc. Bottle. 258,202, 2-10-81, Cl. D9-352.000.

Atwood, Robert G.: *See—*
Elzea, Lorene E.; and Atwood, Robert G., 258,203, Cl. D9-426.000.

Baker, Bertrand M. Bar stool. 258,176, 2-10-81, Cl. D6-35.000.

Baker, Bertrand M. Bar. 258,177, 2-10-81, Cl. D6-144.000.

Baker, Bertrand M. Rocking chair. 258,179, 2-10-81, Cl. D6-49.000.

Barbero, Charles A., Jr.; and Webb, Keith E. Canine quick release collar. 258,243, 2-10-81, Cl. D30-39.000.

Barnes, James E., to Cox, James W., a part interest. Slide support for a chiropractic table. 258,236, 2-10-81, Cl. D24-7.000.

Bayne, Vinton A. Combination stadium seat, cushion and cape carrying case. 258,178, 2-10-81, Cl. D6-47.000.

Beeman, Everett C., to Monsanto Company. Bottle or similar article. 258,197, 2-10-81, Cl. D9-349.000.

Berg, Willie, to Humes and Berg Mfg. Co., Inc. Mute for brass instruments. 258,215, 2-10-81, Cl. D17-13.000.

Berkley & Company, Inc.: *See—*
Rumbaugh, James T., 258,228, Cl. D21-230.000.

Berkline Corporation, The: *See—*
Long, Stapleton, 258,180, Cl. D6-62.000.

Berman, Bernard S.; Schlossberg, Bernard L.; and Kaye, Maurice. Dish drying rack. 258,191, 2-10-81, Cl. D7-188.000.

Bourke, Aubrey M. Rotatable plant container unit. 258,206, 2-10-81, Cl. D11-156.000.

Bozley, Inc.: *See—*
Elzea, Lorene E.; and Atwood, Robert G., 258,203, Cl. D9-426.000.

Bristol-Myers Company: *See—*
Torongo, Albert H., Jr., 258,199, Cl. D9-338.000.

Brown, Horace D. Game board. 258,244, 2-10-81, Cl. D21-20.000.

Cassia Electronic Products Limited: *See—*
Shimasaki, Kenji, 258,221, Cl. D18-7.000.

Cassini, Oleg, to Oleg Cassini, Inc. Perfume bottle. 258,201, 2-10-81, Cl. D9-331.000.

CITC Industries Inc.: *See—*
Cohen, William J., 258,173, Cl. D2-279.000.

CMT Development Corporation: *See—*
Thorne, David, 258,182, Cl. D6-125.000.

Cohen, William J., to CITC Industries Inc. Simulative sports shoe. 258,173, 2-10-81, Cl. D2-279.000.

Coleman Company, Inc., The: *See—*
Adamson, Gerald J., 258,196, Cl. D9-376.000.

Coonen, Willard J. Golf tee. 258,227, 2-10-81, Cl. D21-208.000.

Cox, James W.: *See—*
Barnes, James E., 258,236, Cl. D24-7.000.

Duda, Alex J. Portable golf ball washer. 258,230, 2-10-81, Cl. D21-234.000.

Elzea, Lorene E.; and Atwood, Robert G., to Bozley, Inc. Computer disc container. 258,203, 2-10-81, Cl. D9-426.000.

Englishtown Sportswear Ltd.: *See—*
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Heinfling, Martin, 258,171, Cl. D2-25.000.
Heinfling, Martin, 258,172, Cl. D2-25.000.

Eventoff, Franklin N. Synthesizer. 258,216, 2-10-81, Cl. D17-99.000.

Flanigan, Charles D., to International Business Machines Corporation. Magnetic tape transport unit or similar article. 258,209, 2-10-81, Cl. D14-41.000.

Francis, Edwin S. F. Combined fireplace and heating stove. 258,235, 2-10-81, Cl. D23-97.000.

General Housewares Corp.: *See—*
Miller, William H., 258,189, Cl. D7-64.000.

Glass, Henry P. Etagere. 258,185, 2-10-81, Cl. D6-186.000.

Glassenberg, Marven; and Zidek, Theodore. Rack module. 258,186, 2-10-81, Cl. D6-191.000.

Gooding, Trevor F.: *See—*
Hood, Christopher J.; and Gooding, Trevor F., 258,242, Cl. D28-48.000.

Grady, Benjamin F., Jr., to Sandman, Elaine E. Patio deck or the like. 258,238, 2-10-81, Cl. D25-35.000.

Graser, Clarence F.: *See—*
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H. E. Lauffer Co., Inc.: *See—*
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Heinfling, Martin, to Englishtown Sportswear Ltd. Pocket for jeans or the like. 258,170, 2-10-81, Cl. D2-25.000.

Heinfling, Martin, to Englishtown Sportswear Ltd. Pocket for jeans or the like. 258,171, 2-10-81, Cl. D2-25.000.

Heinfling, Martin, to Englishtown Sportswear Ltd. Pocket for jeans or the like. 258,172, 2-10-81, Cl. D2-25.000.

Helene Curtis Industries, Inc.: *See—*
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Hoffman, Stephen A., to Arcair Company. Air-carbon arc cutting and gouging torch. 258,193, 2-10-81, Cl. D8-30.000.

Hood, Christopher J.; and Gooding, Trevor F., to Wilkinson Sword, Ltd. Razor handle. 258,242, 2-10-81, Cl. D28-48.000.

Humes and Berg Mfg. Co., Inc.: *See—*
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International Business Machines Corporation: *See—*
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International Components Corporation: *See—*
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Itakura, Hitoshi, to Tomy Kogyo Co., Inc. Toy tank. 258,223, 2-10-81, Cl. D21-131.000.

Kawachi, Manabu, to Pioneer Kabushiki Kaisha. Loudspeaker. 258,208, 2-10-81, Cl. D14-34.000.

Kaye, Maurice: *See—*
Berman, Bernard S.; Schlossberg, Bernard L.; and Kaye, Maurice, 258,191, Cl. D7-188.000.

Kira, Yasuhiro, to Nippon Gakki Seizo Kabushiki Kaisha. Synthesizer organ, or the like. 258,214, 2-10-81, Cl. D17-5.000.

Kroll, Frederick H. Halloween bag, or similar article. 258,205, 2-10-81, Cl. D9-305.000.

Long, Stapleton, to Berkline Corporation, The. Seat. 258,180, 2-10-81, Cl. D6-62.000.

Lydford, Geoffrey H., to Russell Finex Limited. Vibratory straining machine. 258,213, 2-10-81, Cl. D15-147.000.

Maloney, Robert W. Jar opener. 258,192, 2-10-81, Cl. D8-18.000.

Marker, Hannes. Ski pole. 258,229, 2-10-81, Cl. D21-230.000.

Maxi-Sweep, Inc.: *See—*
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Mohr, John C., to H. E. Lauffer Co., Inc. Dinner knife. 258,190, 2-10-81, Cl. D7-151.000.

Monsanto Company: *See—*
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Murasaki, Keiichi, to Tomy Kogyo Co., Inc. Toy vehicle. 258,224, 2-10-81, Cl. D21-137.000.

Negrete, George D. Drying tray for fruit. 258,212, 2-10-81, Cl. D15-92.000.

Nelson, George. Desk. 258,184, 2-10-81, Cl. D6-177.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
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Oka, Shigeo, to Pentel Kabushiki Kaisha. Ball point pen or similar article. 258,218, 2-10-81, Cl. D19-49.000.

Oka, Shigeo, to Pentel Kabushiki Kaisha. Automatic pencil or similar article. 258,219, 2-10-81, Cl. D19-49.000.

Oka, Shigeo, to Pentel Kabushiki Kaisha. Clip for a writing instrument or the like. 258,220, 2-10-81, Cl. D19-56.000.

Oleg Cassini, Inc.: *See—*
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Oy Heinrich Frentz Ab: *See—*
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Pauly, Ronald R.: *See—*
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Pentel Kabushiki Kaisha: *See—*
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Pioneer Kabushiki Kaisha: *See—*
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Rawson, Harold J. Toy railroad car railer or similar article. 258,225, 2-10-81, Cl. D21-143.000.

Revlon, Inc.: *See—*
Astor, Barbara; and Scalice, John J., 258,202, Cl. D9-352.000.

Rim, Sang Y.: *See—*
Takada, Yuzo; and Rim, Sang Y., 258,240, Cl. D28-7.000.
Takada, Yuzo; and Rim, Sang Y., 258,241, Cl. D28-7.000.

Robbins, Alan. Portable chair insert for back support. 258,187, 2-10-81, Cl. D6-201.000.

Rudenschold, Carl. Combined handled phonograph record envelope and rain cover therefor. 258,204, 2-10-81, Cl. D9-305.000.

Rumbaugh, James T., to Berkley & Company, Inc. Water ski rope handle. 258,228, 2-10-81, Cl. D21-230.000.

Rumsey, Royce D.; and Pauly, Ronald R., to Tonka Corporation. Toy jack. 258,222, 2-10-81, Cl. D21-124.000.

Russell Finex Limited: *See—*
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St. Martin, Marty, to Maxi-Sweep, Inc. Head for a contour forming underwater vacuum sweep. 258,211, 2-10-81, Cl. D15-63.000.

Sakaoka, Gouji, to Pentel Kabushiki Kaisha. Mechanical pencil or similar article. 258,217, 2-10-81, Cl. D19-49.000.

Sandman, Elaine E.: *See—*
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Segal, Michael. Bottle. 258,198, 2-10-81, Cl. D9-355.000.

Shane, Claudia A.: *See—*
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Shane, William B.; and Shane, Claudia A. Uniform thimble. 258,174, 2-10-81, Cl. D3-29.000.

Shimasaki, Kenji, to Cassia Electronic Products Limited. Combined digital clock and calculator. 258,221, 2-10-81, Cl. D18-7.000.

Shure, Alan, to International Components Corporation. Submersible pump or the like. 258,210, 2-10-81, Cl. D15-7.000.

Skyline Industries, Inc.: *See—*
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Solar Specialties, Inc.: *See—*
Weis, Frederick, 258,232, Cl. D23-72.000.

Stanley, William J. Connector for structural supports. 258,194, 2-10-81, Cl. D8-354.000.

Strickland, Robert. Simulative water toy. 258,226, 2-10-81, Cl. D21-157.000.

Takada, Yuzo; and Rim, Sang Y., to Arigato Fashions, Incorporated. Cosmetic applicator or similar article. 258,240, 2-10-81, Cl. D28-7.000.

Takada, Yuzo; and Rim, Sang Y., to Arigato Fashions, Incorporated. Cosmetic applicator or similar article. 258,241, 2-10-81, Cl. D28-7.000.

Taylor, David H.; Viegas, Herman H.; and Volk, Rodney H., to Thermo King Corporation. Cover for transport refrigeration unit. 258,233, 2-10-81, Cl. D23-142.000.

Thermo King Corporation: *See—*
Anderson, Lowell M.; Arendt, William F.; Graser, Clarence F.; Viegas, Herman H.; and Volk, Rodney H., 258,234, Cl. D23-142.000.
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Thorne, David, to CMT Development Corporation. Combined tennis racket holder and shelf. 258,182, 2-10-81, Cl. D6-125.000.

Tomy Kogyo Co., Inc.: *See—*
Itakura, Hitoshi, 258,223, Cl. D21-131.000.
Murasaki, Keiichi, 258,224, Cl. D21-137.000.

Tonka Corporation: *See—*
Rumsey, Royce D.; and Pauly, Ronald R., 258,222, Cl. D21-124.000.

Torongo, Albert H., Jr., to Bristol-Myers Company. Roll-on dispenser. 258,199, 2-10-81, Cl. D9-338.000.

Viegas, Herman H.: *See—*
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Volk, Rodney H.: *See*—
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Webb, Keith E.: *See*—
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Weckman, Richard L., to Owens-Illinois, Inc. Bottle or similar article. 258,195, 2-10-81, Cl. D9-378.000.
Weckstrom, Bjorn, to Oy Heinrich Frentz Ab. Bottle. 258,200, 2-10-81, Cl. D9-401.000.
Weis, Frederick, to Solar Specialties, Inc. Solar collector panel. 258,232, 2-10-81, Cl. D23-72.000.
Wilkinson Sword, Ltd.: *See*—
Hood, Christopher J.; and Gooding, Trevor F., 258,242, Cl. D28-48.000.
Wilson, Michael C. Combined beverage container and coaster. 258,188, 2-10-81, Cl. D7-3.000.
Zidek, Theodore: *See*—
Glassenberg, Marven; and Zidek, Theodore, 258,186, Cl. D6-191.000.
Zwiren, Jan M., to Helene Curtis Industries, Inc. Comb. 258,239, 2-10-81, Cl. D28-28.000.

LIST OF PLANT PATENTEES

Cameron, James W.: *See*—
Soost, Robert K.; and Cameron, James W., 4,645, Cl. 45.000.
Kirsch, Ted T., to Sun Valley Bulb Farms, Inc. Lily plant named Superstar. 4,646, 2-10-81, Cl. 68.000.
Magnuson, Darryl P., to Richland Sales Co. Peach tree. 4,644, 2-10-81, Cl. 43.000.
Mulligan, James T. Plum tree. 4,643, 2-10-81, Cl. 38.000.
Nor'East Miniature Roses, Inc.: *See*—
Saville, Harmon F., 4,642, Cl. 7.000.
Richland Sales Co.: *See*—
Magnuson, Darryl P., 4,644, Cl. 43.000.
Saville, Harmon F., to Nor'East Miniature Roses, Inc. Rose plant. 4,642, 2-10-81, Cl. 7.000.
Soost, Robert K.; and Cameron, James W., to University of California, The Regents of the. Grapefruit hybrid. 4,645, 2-10-81, Cl. 45.000.
Sun Valley Bulb Farms, Inc.: *See*—
Kirsch, Ted T., 4,646, Cl. 68.000.
University of California, The Regents of the: *See*—
Soost, Robert K.; and Cameron, James W., 4,645, Cl. 45.000.
Weber, Gordon N., to Weber's Riverside Greenhouses. Chrysanthemum plant. 4,647, 2-10-81, Cl. 78.000.
Weber's Riverside Greenhouses: *See*—
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CLASSIFICATION OF PATENTS

ISSUED FEBRUARY 10, 1981

NOTE.—First number, class; second number, subclass; third number, patent number

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152 4,249,991
198 4,249,992
381 4,249,993

CLASS 164

82 4,249,590
246 4,249,591

CLASS 165

1 4,249,592
70 4,249,593
104 F 4,249,594
110 4,249,595
113 4,249,596
166 4,249,597

CLASS 166

54 4,249,598
72 4,249,599
77 4,249,600
208 4,249,601
251 4,249,602
4,249,603
263 4,249,604
266 4,249,605
273 4,249,606
274 4,249,607
275 4,249,608
280 4,249,609
360 4,249,610
367 4,249,611

CLASS 172

43 4,249,612
60 4,249,613
261 4,249,614
266 4,249,615
311 4,249,616

CLASS 173

170 4,249,617

CLASS 174

52 PE 4,250,347
65 SS 4,250,348
67 4,250,349
86 4,250,350
106 R 4,250,351

CLASS 175

9 4,249,618
4,249,619
53 4,249,620
227 4,249,621
4,249,622

CLASS 176

37 4,249,994
65 4,249,995

CLASS 177

136 4,249,623
211 4,249,624

CLASS 179

2 A 4,250,352
5 R 4,250,353
8 A 4,250,354
146 R 4,250,356

CLASS 180

6.7 4,249,625
54 A 4,249,626
73 D 4,249,627
117 4,249,628
134 4,249,629
168 4,249,630
255 4,249,631
274 4,249,632
306 4,249,633

CLASS 182

1 4,249,634
92 4,249,635
152 4,249,636
170 4,249,637
201 4,249,638

CLASS 185

30 4,249,639

CLASS 187

1 R 4,249,640
29 A 4,249,641

CLASS 188

73.2 4,249,642
112 R 4,249,643
196 D 4,249,644
322 4,249,645
328 4,249,646

CLASS 192

103 FA 4,249,647

CLASS 194

102 4,249,648

CLASS 198

332 4,249,649
499 4,249,650
509 4,249,651
796 4,249,652
848 4,249,653

CLASS 200

50 A 4,250,357
52 R 4,250,358
80 R 4,250,359
82 C 4,250,360
82 R 4,250,361
144 AP 4,250,362
144 B 4,250,363
4,250,364
150 R 4,250,365
157 4,250,366
275 4,250,367
307 4,250,368
339 4,250,369

CLASS 202

133 4,249,996
142 4,249,997

CLASS 204

16 4,249,998
28 4,249,999
59 QM 4,250,000
73 A 4,250,001
98 4,250,002
4,250,004
098 4,250,003
159.15 4,250,005
159.18 4,250,006
159.23 4,250,007
180 R 4,250,008
192 N 4,250,009
195 M 4,250,010
224 M 4,250,011
243 M 4,250,012
282 4,250,013

CLASS 206

0.7 4,249,654
63.3 4,249,656
335 4,249,657
409 4,249,658
471 4,249,659

CLASS 208

8 LE 4,250,014
10 4,250,015
11 LE 4,250,016
4,250,017
49 4,250,018
4,250,019
139 4,250,020
181 4,250,021
206 4,250,022

CLASS 209

3 4,250,023
10 4,250,024
31 4,249,655
38 4,250,025
155 4,250,026
233 4,250,027
555 4,249,660
564 4,249,661
583 4,250,028
610 4,249,662
705 4,249,663

CLASS 210

106 4,250,033
170 4,250,034
198.2 4,250,035
297 4,250,036
310 4,250,037
409 4,250,038
416.5 4,250,039
652 4,250,029
684 4,250,030
688 4,250,031
760 4,250,040

CLASS 213

61 4,249,664
4,249,665

CLASS 215

1 C 4,249,666
4,249,667

CLASS 219

10.55 B 4,250,370
69 W 4,250,371
121 LE 4,250,372
4,250,374
121 P 4,250,373
216 4,250,375
218 4,250,396
345 4,250,397
4,250,398
532 4,250,399
549 4,250,400

CLASS 220

2.1 R 4,249,668
216 4,249,669
295 4,249,670
469 4,249,671

CLASS 221

264 4,249,672

CLASS 222

3 4,249,673
153 4,249,674
207 4,249,675
321 4,249,676
326 4,249,677
380 4,249,681
409 4,249,678
542 4,249,679
598 4,249,680

CLASS 224

42.12 4,249,683
42.23 4,249,682
42.4 4,249,684
42.45 R 4,249,685
150 4,249,686
913 4,249,687

CLASS 226

24 4,249,688
172 4,249,689

CLASS 228

15.1 4,249,692

CLASS 229

5.5 4,249,690
15 4,249,691
43 4,249,693

CLASS 235

92 DE 4,250,401
92 DN 4,250,402
4,250,403
92 FP 4,250,404
456 4,250,405

CLASS 236

1 G 4,249,694
12 L 4,249,695
46 R 4,249,696
94 4,249,697

CLASS 239

1 4,249,698

CLASS 241

20 4,249,699
24 4,249,700
46.17 4,249,701
205 4,249,702
247 4,249,703

CLASS 242

7.23 4,249,704
78.6 4,249,705
84.21 R 4,249,706
85.1 4,249,707
107.2 4,249,708
107.3 4,249,709
199 4,249,710

CLASS 244

54 4,249,711

CLASS 248

118 4,249,712
237 4,249,713
267 4,249,714
545 4,249,715

CLASS 250

204 4,250,376
4,250,377
221 4,250,378
229 4,250,379
231 SE 4,250,380
237 G 4,250,381
302 4,250,382
4,250,383
330 4,250,384
363 S 4,250,385
402 4,250,103
4,250,386
445 T 4,250,387
468 4,250,388
476 4,250,389
504 R 4,250,390
4,250,391
505 4,250,392
566 4,250,393
574 4,250,394

CLASS 251

146 4,249,716
210 4,249,717

CLASS 252

1 4,250,041
8.5 C 4,250,042
8.55 R 4,250,044
8.6 4,250,043
32.7 E 4,250,045
49.3 4,250,046
49.5 4,250,047
142 4,250,048
174.11 4,250,049
354 4,250,050
408 4,250,051
426 4,250,052
4,250,053
431 C Re.30,510
437 4,250,054
441 4,250,055
4,250,056
447 4,250,057
448 4,250,058
455 Z 4,250,059
466 J 4,250,060
522 R 4,250,061
4,250,062

CLASS 254

29 A 4,249,718

CLASS 260

4 R 4,250,063
17.4 CL 4,250,064
18 N 4,250,065
25 4,250,066
28.5 AS 4,250,067
28.5 R 4,250,068
29.4 R 4,250,069
29.6 MM 4,250,070
29.7 NR 4,250,071
31.2 N 4,250,072
32.6 NA 4,250,073
32.8 EP 4,250,074
33.6 SB 4,250,075
37 N 4,250,077
38 4,250,076
40 R 4,250,078
42.21 4,250,079
42.46 4,250,080
4,250,081
42.55 4,250,082
45.9 QB 4,250,083
112 R 4,250,084
112.5 R 4,250,085
4,250,086
4,250,087
124 R 4,250,088
141 4,250,089
158 4,250,090
160 4,250,091
185 4,250,123
239 E 4,250,092
239.3 A 4,250,093
245.5 4,250,094
245.6 4,250,095
326 N 4,250,096
335 4,250,097
4,250,098
346.22 4,250,099
348.14 4,250,100
348.57 4,250,101
377 4,250,102
448 AD 4,250,104
453 P 4,250,105
453 SP 4,250,106
502.5 4,250,107
511 4,250,108
928 4,250,124

CLASS 261

41 B 4,250,125
70 4,250,126

CLASS 264

22 4,250,127
24 4,250,128
37 4,250,129
40.7 4,250,130
56 4,250,131
68 4,250,132
130 4,250,133
140 4,250,134
227 4,250,135
257 4,250,136
554 4,250,137
568 4,250,138

CLASS 266

47 4,249,719
104 4,249,720
156 4,249,721
172 4,249,722
193 4,249,723
261 4,249,724

CLASS 272

117 4,249,725
123 4,249,726
132 4,249,727

CLASS 273

29 A 4,249,728
4,249,729
61 C 4,249,730
73 A 4,249,732
73 D 4,249,731
86 C 4,249,733
94 4,249,734
4,249,735
127 R 4,249,736
143 R 4,249,737
144 B 4,249,738
179 A 4,249,739
193 A 4,249,762
260 4,249,740
261 4,249,741
294 4,249,742
391 4,249,743
859 4,249,744

CLASS 279

46 R 4,249,748

CLASS 280

35 4,249,749
216 4,249,750
289 L 4,249,751
605 4,249,752
673 4,249,753
751 4,249,754
804 4,249,755
4,249,756

CLASS 281

15 R 4,249,757

CLASS 285

158 4,249,758
382.2 4,249,759

CLASS 290

1 R 4,250,395

CLASS 292

197 4,249,760
251.5 4,249,761

CLASS 294

19 R 4,249,763
4,249,767
55.5 4,249,764
84 4,249,765
87.2 4,249,766

CLASS 296

63 4,249,768
65 A 4,249,769
146 4,249,771
218 4,249,770

CLASS 297

85 4,249,772
159 4,249,773
311 4,249,774

CLASS 299

4 4,249,775
4,249,776
4,249,777
64 4,249,778
81 4,249,779

CLASS 303

115 4,249,780

CLASS 307

205 4,250,406
209 4,250,407
237 4,250,408
252 A 4,250,409
263 4,250,410
264 4,250,411
279 4,250,412
293 4,250,413
296 A 4,250,414
400 4,250,415

CLASS 308

8.2 4,249,781
187 4,249,782
4,249,783
202 4,249,784

CLASS 310

13 4,250,416
62 4,250,417
64 4,250,418
68 C 4,250,419
83 4,250,420
156 4,250,421
227 4,250,422
258 4,250,423
261 4,250,424

CLASS 312

196 4,249,785

CLASS 313

60 4,250,425
143 4,250,426
217 4,250,427
268 4,250,428
346 R 4,250,429

CLASS 315

5.38 4,250,430
111.9 4,250,431
291 4,250,432
335 4,250,433
362 4,250,434

CLASS 318

138 4,250,435
245 4,250,436
357 4,250,437
561 4,250,438
601 4,250,439
614 4,250,440
626 4,250,441
723 4,250,442

CLASS 320

2 4,250,443

CLASS 322

28 4,250,444

CLASS 323

313 4,250,445

CLASS 324

53 4,250,446
115 4,250,447
127 4,250,448
142 4,250,449
169 4,250,450
239 4,250,451

CLASS 328

1 4,250,452
138 4,250,453
155 4,250,454
167 4,250,455

CLASS 329

50 4,250,456
101 4,250,457
112 4,250,458

CLASS 330

145 4,250,459
252 4,250,460
288 4,250,461
296 4,250,462
298 4,250,463

CLASS 331

65 4,250,464
94.5 D 4,250,465
4,250,467
94.5 M 4,250,466
94.5 PE 4,250,468

CLASS 332

1 4,250,469

CLASS 333

14 4,250,470
4,250,471
166 4,250,472
193 4,250,473
196 4,250,474
205 4,250,475

CLASS 335

17 4,250,476
169 4,250,477
288 4,250,478

CLASS 336

208 4,250,479

CLASS 337

6 4,250,480

CLASS 338

163 4,250,481
275 4,250,482

CLASS 339

15 4,249,786
64 R 4,249,787
94 M 4,249,788

156 R 4,249,789
177 E 4,249,790

CLASS 340

40 4,250,483
52 F 4,250,484
52 R 4,250,485
4,250,486
62 4,250,487
146.3 AG 4,250,488
147 T 4,250,489
321 4,250,491
347 CC 4,250,494
347 DA 4,250,492
347 NT 4,250,493
365 C 4,250,495
384 E 4,250,496
404 4,250,497
556 4,250,498
566 4,250,499
628 4,250,500
664 4,250,501
728 4,250,502
754 4,250,503
758 4,250,504
870.37 4,250,490

CLASS 343

5 LS 4,250,505
100 CS 4,250,506
742 4,250,507
779 4,250,508
806 4,250,509

CLASS 346

19 Re.30,512
75 4,250,510
76 PH 4,250,511
140 R 4,250,512
153.1 4,250,513
198 4,250,315

CLASS 350

16 4,249,791
4,249,792
43 4,249,793
96.20 4,249,794
96.26 4,249,795
174 4,249,797
257 4,249,799
320 4,249,800
346 4,249,801
370 4,249,796
423 4,249,798

CLASS 351

7 4,249,802
46 4,249,803
121 4,249,804

CLASS 352

85 4,249,805

CLASS 353

30 4,249,806

CLASS 354

4 4,249,807
4,249,808
23 D 4,249,809
63 4,249,810
86 4,249,811
120 4,249,812
128 4,249,813
154 4,249,814
241 4,249,815
266 4,249,816
293 4,249,817
312 4,249,818
4,249,819

CLASS 355

29 4,249,820
64 4,249,821
74 4,249,822

CLASS 356

128 4,249,823
155 4,249,824
223 4,249,825
244 4,249,826
402 4,249,827

CLASS 357

14 4,250,514
16 4,250,515
4,250,516
24 4,250,517
27 4,250,518
41 4,250,519
68 4,250,520

CLASS 358

8 4,250,521
55 Re.30,513
76 4,250,522
122 4,250,524
148 4,250,525
294 4,250,526

CLASS 360

75 4,250,527
98 4,250,528
4,250,529
105 4,250,530

CLASS 361

2 4,250,531
96 4,250,532
103 Re.30,514
172 4,250,533
272 4,250,534
335 4,250,535
413 4,250,536

CLASS 362

86 4,250,537
97 4,250,538
196 4,250,539
368 4,250,540

CLASS 363

28 4,250,541
35 4,250,542

CLASS 364

105 4,250,543
110 4,250,544
200 4,250,545
4,250,546
4,250,547
4,250,548
465 4,250,550
474 4,250,551
483 4,250,552
510 4,250,553
560 4,250,554
571 4,250,555
600 4,250,556
605 4,250,557
607 4,250,558
815 4,250,559
900 4,250,560
4,250,561
4,250,562
4,250,563

CLASS 365

6 4,250,564
87 4,250,565
88 4,250,566
109 4,250,567
149 4,250,568
185 4,250,569
200 4,250,570

CLASS 366

102 4,249,828

CLASS 368

10 4,250,571
71 4,250,572
73 4,250,573
82 4,250,523
184 4,250,574
227 4,250,575
323 4,250,576

CLASS 369

136 4,249,747
219 4,249,745
221 4,249,746

CLASS 400

144.2 4,249,829

CLASS 403

7 4,249,830
12 4,249,831

CLASS 404

6 4,249,832
114 4,249,327

CLASS 405

58 4,249,833
70 4,249,834
259 4,249,835
267 4,249,836
290 4,249,837

CLASS 406

51 4,249,838
109 4,249,839

CLASS 410

81 4,249,840

CLASS 414

14 4,249,841
24.5 4,249,842
44 4,249,843
45 4,249,844
133 4,249,845
217 4,249,846
330 4,249,847
332 4,249,848
404 4,249,849
491 4,249,850
494 4,249,851
514 4,249,852
543 4,249,853
685 4,249,854
786 4,249,855

CLASS 415

25 4,249,856
36 4,249,857
64 4,249,858
79 4,249,859
111 4,249,860

CLASS 416

132 A 4,249,861
134 A 4,249,862
185 4,249,863

CLASS 417

77 4,249,864
200 4,249,865
280 4,249,866
334 4,249,867
511 4,249,868

CLASS 422

21 4,250,139
43 4,250,140
44 4,250,141
68 4,250,142
109 4,250,143
112 4,250,144
151 4,250,145
179 4,250,146
189 4,250,147
246 4,250,148

CLASS 423

50 4,250,149
121 4,250,032
226 4,250,150
230 4,250,151
242 4,250,152
4,250,153
317 4,250,154
321 R 4,250,155
416 4,250,156
417 4,250,157
449 4,250,158
480 4,250,159
547 4,250,160

CLASS 424

1 4,250,161
4,250,162
14 4,250,163
61 4,250,164
76 4,250,165
81 4,250,166
94 4,250,167
127 4,250,168
181 4,250,169
4,250,170
189 4,250,171
245 4,250,179
246 4,250,173
248.5 4,250,174
248.51 4,250,175
249 Re.30,511
250 4,250,176
4,250,177
4,250,180
4,250,181
251 4,250,178
257 4,250,182
263 4,250,183
267 4,250,184
273 P 4,250,185
273 R 4,250,186
282 4,250,187
285 4,250,188
287 4,250,189
298 4,250,190
308 4,250,191
309 4,250,192
358 4,250,193

CLASS 425

13 4,249,869
63 4,249,870
111 4,249,871
4,249,872
4,249,873
127 4,249,874
133.1 4,249,875
145 4,249,876
204 4,249,877
237 4,249,878
311 4,249,879
451.2 4,249,880
543 4,249,881
547 4,249,882

CLASS 426

3 4,250,194
5 4,250,195
4,250,196
51 4,250,197
335 4,250,198
533 4,250,199
536 4,250,200
538 4,250,201
553 4,250,202

CLASS 427

44 4,250,203
58 4,250,204
87 4,250,205
88 4,250,206
211 4,250,207
249 4,250,208
250 4,250,209
252 4,250,210
356 4,250,211
386 4,250,212
409 4,250,213

CLASS 428

35 4,250,215
78 4,250,216
161 4,250,217
166 4,250,218
212 4,250,219
4,250,220
234 4,250,172
284 4,250,221
285 4,250,222
4,250,223
310 4,250,224
336 4,250,225
344 4,250,226
461 4,250,227
514 4,250,214
539 4,250,228
606 4,250,229

CLASS 429

12 4,250,230
13 4,250,231
56 4,250,232
140 4,250,233
206 4,250,234
211 4,250,235
221 4,250,236

CLASS 430

17 4,250,237
4,250,238
42 4,250,239
66 4,250,240
114 4,250,241
141 4,250,242
215 4,250,243
217 4,250,244
218 4,250,245
223 4,250,246
270 4,250,247
284 4,250,248
355 4,250,249
374 4,250,250
449 4,250,251
505 4,250,252

CLASS 431

20 4,249,883
31 4,249,884
38 4,249,885
90 4,249,886
365 4,249,887

CLASS 432

3 4,249,888
11 4,249,889
13 4,249,890
14 4,249,891
4,249,892
49 4,249,893
95 4,249,894
128 4,249,895

CLASS 433

8 4,249,897
21 4,249,898
32 4,249,899
79 4,249,900
119 4,249,901
132 4,249,896

CLASS 434

103 4,249,318

CLASS 435

4 4,250,257
7 4,250,253
14 4,250,254
15 4,250,255
32 4,250,256
45 4,250,258
148 4,250,259
176 4,250,260
190 4,250,261
193 4,250,262
234 4,250,263
253 4,250,264
272 4,250,265
289 4,250,266
317 4,250,267

CLASS 474

110 4,249,425

CLASS 493

409 Re.30,508

CLASS 525

6 4,250,269
54 4,250,270
66 4,250,271
89 4,250,272
99 4,250,273
100 4,250,268
127 4,250,274
128 4,250,275
263 4,250,276
337 4,250,277
340 4,250,278
425 4,250,279
437 4,250,280
444 4,250,281
509 4,250,282

CLASS 526

77 4,250,283
124 4,250,284
125 4,250,285
4,250,286
4,250,287
137 4,250,288
201 4,250,289

CLASS 528

14 4,250,290
44 4,250,292
93 4,250,293
210 4,250,294
272 4,250,295
295 4,250,296
338 4,250,291
340 4,250,297
342 4,250,298
4,250,299
401 4,250,300

CLASS 536

4 4,250,301
17 A 4,250,303
17 R 4,250,304
84 4,250,305
88 4,250,306

CLASS 544

030 4,250,307
190 4,250,308
221 4,250,309
379 4,250,310

CLASS 546

9 4,250,311
19 4,250,312
4,250,313
21 4,250,314
287 4,250,316

CLASS 548

229 4,250,318
327 4,250,317

CLASS 549

61 4,250,319

CLASS 556

404 4,250,320

CLASS 560

26 4,250,322
53 4,250,321
4,250,323
62 4,250,324
121 4,250,325
124 4,250,326
169 4,250,327
205 4,250,328
232 4,250,329

CLASS 562

409 4,250,330
485 4,250,331

CLASS 564

104 4,250,109
129 4,250,111
153 4,250,113
156 4,250,110
291 4,250,112
424 4,250,114
436 4,250,115
467 4,250,116

CLASS 568

338 4,250,118
343 4,250,338
347 4,250,332
361 4,250,341
377 4,250,117
389 4,250,119
431 4,250,121
445 4,250,120
471 4,250,339
639 4,250,340
652 4,250,333
683 4,250,334
771 4,250,335
772 4,250,336
826 4,250,342
853 4,250,337
903 4,250,343

CLASS 570

209 4,250,122

CLASS 585

437 4,250,344
467 4,250,345
658 4,250,346

CLASSIFICATION OF DESIGNS

D2—	25	258,170		150	258,183			258,205		41	258,209		56	258,220	D23—	72	258,232
		258,171		177	258,184		331	258,201	D15—	7	258,210	D21—	20	258,244		97	258,235
		258,172		186	258,185		338	258,199		63	258,211		124	258,222		142	258,233
	279	258,173		191	258,186		349	258,197		92	258,212		131	258,223			258,234
D3—	29	258,174		201	258,187		352	258,202		147	258,213		137	258,224	D24—	7	258,236
	74	258,175	D7—	3	258,188		355	258,198	D17—	5	258,214		143	258,225		28	258,237
D6—	35	258,176		64	258,189		376	258,196		13	258,215		157	258,226	D25—	35	258,238
	47	258,178		151	258,190		378	258,195		99	258,216		208	258,227	D28—	7	258,240
	49	258,179		188	258,191		401	258,200	D18—	7	258,221		230	258,228			258,241
	62	258,180	D8—	18	258,192		426	258,203	D19—	49	258,217			258,229		28	258,239
	86	258,181		30	258,193	D11—	156	258,206			258,218		234	258,230		48	258,242
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	144	258,177	D9—	305	258,204	D14—	34	258,208									

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